

## Personality and Social Psychology

# Does a short self-compassion intervention for students increase healthy self-regulation? A randomized control trial

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Dundas, I., Binder, P.-E., Hansen, T. G. B. & Stige, S. H. (2017). Does a short self-compassion intervention for students increase healthy self-regulation? A randomized control trial. *Scandinavian Journal of Psychology*, 58, 443–450.

The primary aim of this study was to examine the effects of a two-week self-compassion course on healthy self-regulation (personal growth self-efficacy and healthy impulse control) and unhealthy self-regulation (self-judgment and habitual negative self-directed thinking) in university students. We also examined the effects on self-compassion, anxiety and depression. Students ( $N = 158$ , 85% women, mean age = 25 years) were randomized to an intervention group and a waiting-list control group in a multi-baseline randomized control trial. Healthy self-control was measured by the Personal Growth Initiative Scale (PGIS) and the Self-Control Scale; unhealthy self-control was measured by the Non-judgement subscale from the Five-Facet Mindfulness Questionnaire (reversed) and the Habit Index of Negative Thinking (HINT). Secondary outcomes were measured by the State-Trait Anxiety Inventory (STAI-trait), the Major Depression Inventory (MDI), and the Self-Compassion Scale (SCS). A  $2 \times 3$  repeated measures analysis of variance (ANOVA) showed gains for the intervention-group in personal growth self-efficacy and healthy impulse-control and reductions in self-judgment and habitual negative self-directed thinking, as well as increases in self-compassion and reductions in anxiety and depression. After all participants had completed the course, the groups were combined and repeated measures ANOVAs showed that changes remained at six-month follow-up for personal growth self-efficacy, self-judgment and habitual negative self-directed thinking; as well as for self-compassion, anxiety and depression. Concluding, a short self-compassion course seems an effective method of increasing self-compassion and perceived control over one's life for university students, as well as increasing mental health.

**Key words:** Self-compassion, mindfulness, randomized control trial, self-regulation, mental health, students.

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## INTRODUCTION

Student life may contain many academic and social stressors, such as geographic relocation, academic failure, loneliness, and social rejection. The way students engage with academic and social challenges and exercise self-discipline may have important implications for their wellbeing and mental health. A sizable minority of students experience mental health problems, such as sadness and anxiety (e.g. Conley, Durlak & Dickson, 2013; Stallman, 2010). In a recent study, a third (33%) of a large sample of Norwegian university students ( $N = 26,779$ ) reported experiencing moderate to serious psychological symptoms during the previous two weeks. This is more than twice the prevalence found in Norwegian non-students within the same age group (12%) and has increased from 25% in 2010. Only 13% of the students reported seeking help. Such figures indicate a need for easily accessible and effective psychological interventions for students.

Self-regulation and self-control encompass a wide range of behaviors that help individuals modulate responses (Nigg, 2017). As used here, the concept of self-regulation includes both the healthy sense of being able to influence one's life, and healthy impulse control. Self-compassion is described as a healthy way of responding to failure and distress, and refers to the disposition to meet distress with self-directed kindness (self-kindness vs. self-judgment), understand that one is not alone in experiencing difficulties (common humanity vs. isolation), and notice any

distressing feelings without getting lost in them (mindfulness vs. overidentification, Neff, 2003).

It has been argued that the greatest obstacle to self-compassion is the fear that it implies self-indulgence, evasion of responsibility, and lack of motivation to regulate or change unwanted traits (Gilbert, McEwan, Matos & Rivis, 2011; Neff & Germer, 2013). However, correlational and experimental research suggests that self-compassion might make students more rather than less motivated to grow and learn. Self-compassion has been shown to be positively related to mastery orientation (Neff, Hsieh & Dejitterat, 2005), to enable students to discard unreachable goals and adopt more functional goals (Neely, Schallert, Mohammed, Roberts & Chen, 2009), to be less defensive when receiving feedback (Leary, Tate, Adams, Batts Allen & Hancock, 2007), and to be more motivated to study after a difficult test (Breines & Chen, 2012). Several experiments have shown that inducing self-compassion (for example through a short writing assignment) may have favorable effects in student samples (e.g. Arimitsu & Hofmann, 2017; Johnson & O'Brian, 2013; Leary *et al.*, 2007; Odou & Brinker, 2014).

Most studies of self-compassion and motivation have been correlational or experimental, and there is little knowledge of the effects of self-compassion courses for students, particularly long-term effects. Two recent studies have suggested that mindful self-compassion courses may increase student self-efficacy and optimism (Smeets, Neff, Alberts & Peter, 2014), as well as reduce negative thoughts and emotions (Arimitsu, 2016). To the best of

our knowledge, there have been no direct investigations into whether a short self-compassion course for students might also increase healthy forms of self-regulation.

The aim of this study was to examine the effects of a short self-compassion course on self-regulation and psychological health in Norwegian university level students. Our primary hypothesis was that a self-compassion course would replace negative forms of self-regulation with more healthy forms of self-regulation. Healthy self-regulation was operationalized as feeling able to influence one's life and growth positively, which we call personal growth self-efficacy (Robitschek, 1998), and to override one's cognitive, affective, and action tendencies in order to behave according to one's values and goals, even when one strongly desires to do otherwise, which we call healthy impulse control (Baumeister, Baumeister, Gailliot & DeWall, 2006). Unhealthy self-regulation was operationalized as a tendency for self-judgment and habitual negative self-directed thinking.

A secondary aim of the study was to examine if the self-compassion course would also increase self-compassion, and reduce depression and anxiety. Cross-sectional studies and studies in community and clinical samples have repeatedly shown self-compassion to be negatively associated with anxiety and depression (Macbeth & Gumley, 2012). To our knowledge, there is only one prior study on the effects of a self-compassion intervention on anxiety and depression in university students specifically. Arimitsu (2016) examined the effects of a self-compassion intervention on anxiety and depression in a Japanese sample containing 80% university students, and found that the intervention reduced both.

In summary, we expected the self-compassion training to increase healthy self-regulation (personal growth self-efficacy and healthy impulse control) and reduce unhealthy self-regulation (self-judgment and habitual negative self-directed thinking). We furthermore expected the training to increase self-compassion and decrease anxiety and depression. Pre-post changes in outcomes were expected to correlate with pre-post changes in self-compassion, and to remain at six-month follow-up.

## METHOD

### *Intervention*

The intervention was based on components of the Mindful Self-Compassion (MSC) course developed by Neff and Germer (2013), and elements of Compassionate Mind Training (CMT, Gilbert & Procter, 2006), and Mindfulness-Based Stress Reduction (MBSR, Santorelli & Kabat-Zinn, 2009). It comprised three 90-minute sessions delivered over a period of two weeks. Sessions were led by a specialist in clinical psychology (the second author), with extensive experience in teaching mindfulness and self-compassion. A second clinical specialist (the first author) was available to help if a participant needed one-to-one attention.

The first session introduced participants to mindfulness and self-compassion using 15-minute lectures, short mindfulness and self-compassion exercises, group discussions and experiential practices. Experiential practices are practices in which participants are first asked to immerse themselves in an experience and then to reflect on this experience to develop a better understanding of the issue. For example, participants were asked to reflect on, and then write down, what they would say to themselves to improve something they disliked about themselves. Then they were asked to reflect upon and write down what they would say to a friend under similar circumstances. Participants were then encouraged to

discuss the differences between how they tended to treat themselves vs. others, and the influence this had on themselves. The second session dealt with mindfulness, common physical stress reactions, shame reactions, dealing with destructive self-criticism, how self-compassionate behavior might influence the body and mind, and activating and soothing affect systems within an evolutionary and attachment framework (Gilbert & Procter, 2006). The third and final session comprised discussions on positive feelings, reflections on how one wants to live, and further discussions about compassion for oneself and others.

Participants were provided with audio guides to mindfulness and self-compassion exercises for daily use between sessions, as well as copies of the PowerPoint presentations given in each session. Between the first and second sessions, participants were encouraged to use the 15-minute audio guides to practice 'affectionate breathing' and 'loving kindness for ourselves' on a daily basis. These exercises were adapted from the MSC program (Neff & Germer, 2013). Between the second and third sessions, participants were expected to use the audio guides to practice two new 15-minute exercises: 'mindfulness of breathing, body, and emotions', adapted from the MBSR program (Santorelli & Kabat-Zinn, 2009), and 'giving and receiving compassion', adapted from the MSC program (Neff & Germer, 2013).

### *Procedure*

Participants were recruited to a study on 'self-compassion for students' via information on student websites hosted by a local university and two university colleges. Figure 1 illustrates the study flow. A link for reading about and registering for the study, and completing the first baseline measures (T1) was available for a month. As they registered, survey participants were randomized 1:1 by the first author in accordance with a web-site generated list ([www.randomizer.org](http://www.randomizer.org)) to receive the intervention first (group 1 = intervention group) or three weeks later than the intervention group (group 2 = waiting list group). There were two baselines (on average three weeks apart): at recruitment (T1) and during a one-week time window immediately before the first course started (T2). Multiple baselines are most commonly used in single-case studies but they can also be used in group studies. They enable an assessment of whether change occurs during the intervention period, rather than beforehand or as a result of some extraneous factor, for example, participants having made a decision to change. The intervention group received the intervention immediately after completing the measures at the second baseline, and completed post measures during a one-week time window immediately after the course (T3<sub>1</sub>). The waiting list group completed a third baseline at this time and received the intervention immediately after the one-week window had closed. The waiting list group completed post intervention measures during a one week time window after their course (T3<sub>2</sub>), as did the intervention group. All participants received a link to questionnaires six months after their respective courses had ended (T4<sub>1</sub> and T4<sub>2</sub>). Approximately one month after the waiting list group had completed the course, another sequence of courses was scheduled to collect a second wave of data. This decision was based on the assumption that there would be some attrition before six-month follow-up that would require a larger sample size.

Assignment to courses was blind in the sense that the participants did not know the nature of the randomization sequence, although they of course knew whether they had received the intervention when completing measures at T3<sub>1</sub>. There were no changes to the methods after the commencement of the trial. Care was taken to inform participants of the nature of the project before they enrolled and to protect their anonymity. The study was approved by the local ethics committee (For further detail on procedure and study flow, see Supplementary Information, section 1).

### *Participants*

Participants ( $N = 158$ , 85% women, mean age 25 years, standard deviation [ $SD$ ] = 4.9) were recruited during spring 2016, with enrolment at one of two university colleges or at the university as the only inclusion criteria.

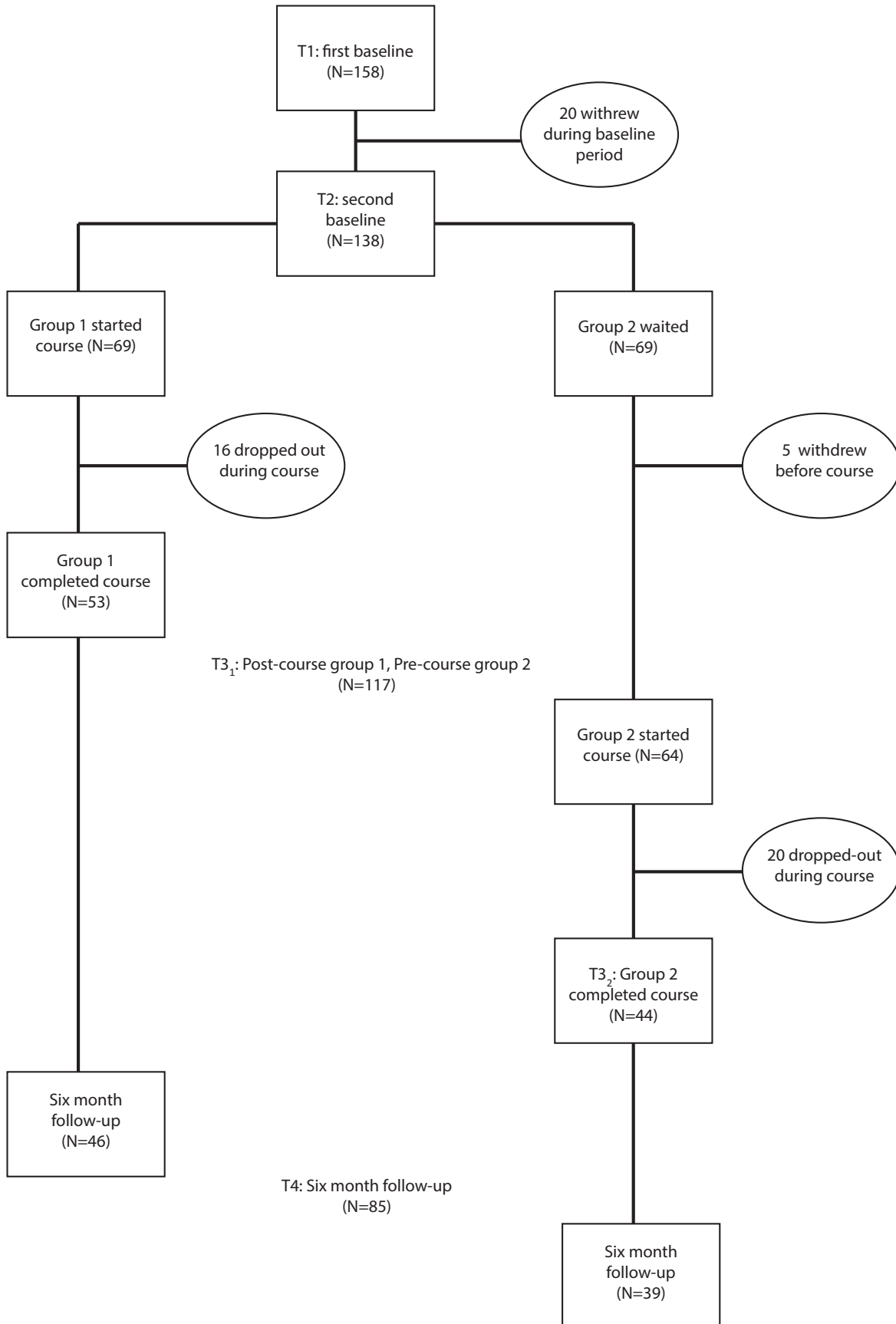


Fig. 1. Study flow.

Of these, 117 completed the first part of the study (53 in the intervention group and 64 in the control group). These intervention and control groups were similar with respect to age, gender, and baseline values of six of the seven outcome variables. On the seventh variable, personal growth-related self-efficacy, the intervention group had significantly lower scores than the waiting list control group at both baselines (T1:  $t(115) = 2.07, p = 0.04$ ; T2:  $t(116) = 2.8, p = 0.006$ ). The control group (group 2) was offered the intervention one week after the intervention-group (group 1) had completed theirs. In all, 97 students completed the interventions (53 in group 1 and 44 in group 2), and 85 completed the six-month follow-up measures (46 in group 1 and 39 in group 2). A *t*-test comparing completers and dropouts showed that they were similar with respect to gender, age, and baseline values of the variables of interest (see Supplementary Information, section 2).

### Measures

The same instruments were used at all time points. The psychometric qualities of the Norwegian translations are described in the Supplementary Information, section 3.

#### Primary measures

**Personal Growth Initiative Scale (PGIS).** We used the nine-item PGIS (Robitschek, 1998) to indicate personal growth self-efficacy. The scale was developed to assess intentional engagement and self-efficacy with regard to personal growth. The items describe being the agent of one's life, e.g., 'I take charge of my life', and responses are given on a six-point Likert scale ranging from 'definitely disagree' to 'definitely agree'. In terms of reliability, the original scale has high internal consistency ( $\alpha = 0.90$ ) and correlates with, for example, internal locus of control (Robitschek, 1998). The present internal consistency was  $\alpha = 0.88$ .

**Self-control Scale.** We used the 10-item Self-control Scale (Tangney, Baumeister & Boone, 2004) to assess healthy impulse control. The scale assesses self-control on a five-point scale from 'not at all like me' to 'very much like me'. The items reflect healthy impulse control, e.g., 'I say inappropriate things' (reverse scored). The scale has shown adequate psychometric characteristics (Tangney *et al.*, 2004), and the internal consistency of the scale in this study was  $\alpha = 0.84$ .

**Self-judgment.** The eight-item non-judgment subscale of the Five Facet Mindfulness Questionnaire (Baer, Smith, Hopkins, Krietemeyer & Toney, 2006) captures the tendency to judge oneself harshly using items such as 'I criticize myself for having irrational or inappropriate emotions'. As all items are negatively worded, we chose to use this as a self-judgment inventory. Responses are given on a five-point Likert scale ranging from 'never or very rarely true' to 'always or almost always true'. The internal consistency in this study was  $\alpha = 0.84$ .

**Habit Index of Negative Thinking (HINT).** HINT (Verplanken, Friborg, Wang, Traminow & Woolf, 2007) consists of 12 items and measures the tendency habitually to think negatively about oneself, called the habit of self-directed negative thinking in this study. Responses to items are given using a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. One item was slightly re-worded so that the scale as a whole could reflect change. The internal consistency was  $\alpha = 0.94$ .

#### Secondary measures

**Self-compassion.** We used the 12-item short form of the Self-Compassion Scale (SCS-SF; Raes, Pommier, Neff & Van Gucht, 2011), for example: 'When I'm going through a very hard time, I give myself the caring and tenderness I need'. Responses are given using a five-point Likert scale ranging from 'almost always' to 'almost never'. The short form has been shown to have adequate internal consistency and near-perfect correlation

( $r \geq 0.97$ ) with the long form (Raes *et al.*, 2011). In this study the internal consistency was  $\alpha = 0.88$ .

**Trait section of the State and Trait Anxiety Inventory (STAI).** On the twenty-item trait section of the State and Trait Anxiety Inventory (STAI; Spielberger, Gorsuch & Lushene, 1970), the respondent uses a four-point Likert scale ranging from 'almost never' to 'almost always' to indicate the extent to which items such as 'I am a steady person' apply to him or her. The scale has shown adequate psychometric properties in several languages, including Norwegian (Håseth, Hagtvet & Spielberger, 1990). The internal consistency was  $\alpha = 0.91$ .

**Major Depression Inventory (MDI).** The twelve-item MDI (Bech, Rasmussen, Olsen, Noerholm & Abildgaard, 2001) assesses symptoms of depression. The respondent uses a six-point Likert scale ranging from 'not at all' to 'all of the time' to indicate how frequently he or she has experienced various symptoms during the previous two weeks. Two of the 12 items consist of pairs of statements (e.g., 8a: 'Have you felt very restless?' or 8b: 'Have you felt subdued?') and only the higher scoring statement from the pair is included in the statistical analysis. The internal consistency was  $\alpha = 0.87$ .

## RESULTS

### Correlations at baseline

A bivariate correlation analysis showed that the indicators of healthy self-regulation were indeed associated with less anxiety and depression, ranging from  $r = -0.32$  to  $r = -0.64$ . Likewise, the measures of unhealthy self-regulation were associated with higher levels of anxiety and depression, ranging from  $r = 0.48$  to  $r = 0.70$ . Correlations between all measures at baseline are shown in Table S3 in the Supplementary Information.

### Did the intervention increase healthy self-regulation and reduce unhealthy self-regulation?

A series of 2 (group)  $\times$  3 (time) repeated measures analyses of variance (ANOVAs) were conducted to compare changes in the intervention and control groups for the completer sample (Table 1,  $N = 117$ ). We expected no changes during baseline (T1–T2). Furthermore, we expected to find significant pre-post increases in: (1) personal growth self-efficacy and (2) healthy impulse control, and pre-post decreases in (3) self-judgment and (4) habitual negative self-directed thinking in the intervention group only. In what follows, results are reported for each of these indicators of self-regulation. Greenhouse–Geisser corrected estimates are reported whenever Mauchly's test was significant. For significant group-by-time interactions, pairwise tests of marginal means with Sidak adjustments are used to compare mean scores at different time points within each group. The measurement time points are: T1 = first baseline, T2 = second baseline (i.e., during the last week pre-course), and T3<sub>1</sub> = post-course (when only the intervention group had attended the course).

For personal growth self-efficacy, there was a moderate group-by-time interaction ( $F(1.8, 203) = 15.33, p < 0.001$ , Cohen's  $d = 0.74$ ), with no significant change during baseline for either of the groups, and an increase in personal growth self-efficacy during the intervention for the intervention group only (mean difference T2–T3<sub>1</sub> = 0.39,  $p < 0.001$ ). For healthy impulse control, there



Table 1. Pre- and post-intervention mean scores and effect-sizes for the interactions in the 2 (group) by 3 (time) repeated measures ANOVAs

Outcome	Intervention group (N = 53)			Control group (N = 64)			F	Effect size (Cohen's <i>d</i> ) [95% CI]
	Baseline 1 <i>M</i> ( <i>SD</i> )	Baseline 2 <i>M</i> ( <i>SD</i> )	Post- intervention <i>M</i> ( <i>SD</i> )	Baseline 1 <i>M</i> ( <i>SD</i> )	Baseline 2 <i>M</i> ( <i>SD</i> )	Baseline 3 <i>M</i> ( <i>SD</i> )		
Healthy and unhealthy self-regulation								
Personal growth self-efficacy	3.70 (0.88)	3.73 (0.84)	4.12 (0.75)	4.06 (0.80)	4.16 (0.77)	3.98 (0.83)	15.33***	0.74 [0.47,1.02] (M)
Healthy impulse control	3.23 (0.75)	3.12 (0.73)	3.40 (0.59)	3.24 (0.64)	3.26 (0.64)	3.25 (0.65)	6.73**	0.49 [0.22,0.76] (S)
Self-judgment	3.07 (0.97)	3.00 (0.94)	2.45 (0.74)	3.11 (0.92)	2.97 (0.98)	3.09 (0.89)	14.71 ***	0.72 [0.45,1.00] (M)
Self-directed negative thinking	3.59 (0.93)	3.64 (0.82)	3.09 (0.91)	3.42 (1.06)	3.37 (1.08)	3.35 (1.16)	13.01***	0.67 [0.41,0.95] (M)
Self-compassion, anxiety and depression								
Self-compassion	2.74 (0.66)	2.80 (0.62)	3.35 (0.57)	2.83 (0.62)	2.92 (0.70)	2.93 (0.72)	25.53 ***	0.94 [0.66, 1.23] (L)
Anxiety	2.56 (0.51)	2.54 (0.53)	2.23 (0.48)	2.49 (0.53)	2.43 (0.58)	2.47 (0.57)	19.51 ***	0.83 [0.56, 1.11] (L)
Depression	2.76 (0.82)	2.90 (0.90)	2.52 (0.86)	2.74 (0.92)	2.63 (0.92)	2.67 (1.00)	4.55*	0.40 [0.14, 0.67] (S)

Notes: M = mean, SD = standard deviation; (L) = large effect size; (M) = moderate effect size; (S) = small effect size; CI = confidence interval for Cohen's *d*; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

was a small group-by-time interaction ( $F(1.9, 215) = 6.73, p = 0.002$ , Cohen's  $d = 0.49$ ), with stability during baseline for both groups, and an increase in healthy impulse control during the intervention for the intervention group only (mean difference  $T2-T3_1 = 0.28, p < 0.001$ ). For self-judgment there was a moderate group-by-time interaction ( $F(2, 228) = 14.71, p < 0.001$ , Cohen's  $d = 0.72$ ), with no significant changes during baseline for either of the groups, and a reduction in self-judgment during the intervention for the intervention group only (mean difference  $T2-T3_1 = -0.56, p < 0.001$ ). For habitual negative self-directed thinking, there was a moderate group-by-time interaction ( $F(1.8, 201) = 13.01, p < 0.001$ , Cohen's  $d = 0.67$ ), with no changes during baseline for either of the groups, and a reduction in habitual negative self-directed thinking during the intervention in the intervention group only (mean difference  $T2-T3_1 = -0.55, p < 0.001$ ). In summary, these analyses suggest that the self-compassion training increased healthy self-regulation and reduced unhealthy self-regulation.

As there was a 26% attrition rate from first baseline to post-intervention, the above analyses were repeated with pre-intervention scores carried forward to replace missing scores in an intention-to-treat analysis. All students who had expressed interest in the course ( $N = 158$ ) were included, including those who had withdrawn before the courses started. The same pattern of results as reported above for the completer sample was found in the intention-to-treat sample (Supplementary Information, section 6). To summarize, the intention-to-treat analyses suggested that the results observed in the completer sample were robust.

#### Changes over the entire study period for groups combined: Did changes in self-regulation remain at six-month follow-up?

After the waiting list control group had been offered the intervention, the intervention and waiting list groups were combined to increase power, and a series of repeated measures ANOVAs were conducted to examine changes over the entire study period, including the six-month follow-up, in the completer sample. The measurement time points were: T1 = first baseline, T2 = second baseline (i.e., during the last week

pre-course), T3 = post-course for both groups, and T4 = at six-month follow-up.

*Personal growth self-efficacy.* For personal growth self-efficacy, there was a large effect of time ( $F(2.53, 192) = 27.51, p < 0.001$ , Cohen's  $d = 1.22$ ). Pairwise comparisons of estimated marginal means showed no change between baselines, and a significant increase between the second baseline and immediately post-course (mean difference  $T2-T3_2 = 0.42, p < 0.001$ ). There were no significant changes between post-course and six-month follow-up. At six-month follow-up, marginal mean scores remained significantly higher than they had been at both baselines (mean difference  $T1-T4 = 0.55, p < 0.001$ , mean difference  $T2-T4 = 0.51, p < 0.001$ ).

*Healthy impulse control.* For the second measure of healthy self-regulation, that is, healthy impulse control, there was a moderate effect for time ( $F(1.6, 123) = 6.72, p < 0.001$ , Cohen's  $d = 0.59$ ). Pairwise comparisons based on estimated marginal means showed no change between baseline points, significant increases during the course (mean difference  $T2-T3_2 = 0.27, p < 0.001$ ), and no change from post-course to six-month follow-up. At six-month follow-up, healthy impulse control scores were significantly higher than they had been at the second baseline (mean difference  $T2-T4 = 0.27, p = 0.04$ ). The difference between the six-month follow-up mean and the first baseline mean did not, however, reach significance (mean difference  $T1-T4 = 0.20, p = 0.31$ ).

*Self-judgment.* For self-judgment, there was a very large effect of time ( $F(2.5, 192) = 44.09$ , Cohen's  $d = 2.35$ ). Pairwise comparisons based on estimated marginal means showed no change during baseline, significant reductions between the second baseline and post-course (mean difference  $T2-T3_2 = -0.63, p < 0.001$ ), and no change during follow-up. At six-month follow-up, the means remained significantly lower than they had been at the first baseline (mean difference  $T1-T4 = -0.78, p < 0.001$ ) and at the second baseline (mean difference  $T2-T4 = -0.68, p < 0.001$ ).

*Habitual negative self-directed thinking.* For habitual negative self-directed thinking, there was a large effect of time

( $F(3, 225) = 23.03$ , Cohen's  $d = 1.25$ ), with no significant change during baseline, decreases during the course (mean difference  $T2-T3_2 = -0.55$ ,  $p < 0.001$ ), and no significant change between post-course and six-month follow-up. At six-month follow-up, marginal means were significantly lower than they had been at both baseline points (mean difference  $T1-T4 = -0.61$ ,  $p < 0.001$ , mean difference  $T2-T4 = -0.63$ ,  $p < 0.001$ ).

Due to the 46% attrition during the whole study, we repeated the above repeated measures ANOVA as an intention-to-treat analysis of changes during the entire study, with the last observation carried forward ( $N = 158$ ; see Supplementary Information, section 7). These analyses showed the same pattern of change as the analyses for the completers: significant change during the course remaining at follow-up, suggesting that changes observed in the completer sample were robust.

In summary, all measures of self-regulation changed as expected, except that for healthy impulse control for which the difference between the first baseline and the six-month follow-up did not reach significance.

#### *Did the intervention increase self-compassion and reduce anxiety and depression?*

In accordance with the secondary aim of the study, a series of 2 (group)  $\times$  3 (time) repeated measures ANOVAs were then conducted to explore changes among the two groups for self-compassion, anxiety, and depression (Table 1). The goal of these analyses was to assess whether the intervention group showed a greater improvement on these outcomes than the control group shortly after the course, that is, before the waiting list group had received the intervention, at  $T3_1$  ( $N = 117$ ). The measurement time points were:  $T1$  = first baseline,  $T2$  = second baseline (i.e., during the last week pre-course), and  $T3_1$  = post-course (when only the intervention group had attended the course).

For self-compassion, there was a group-by-time interaction ( $F(1.8, 207) = 25.53$ ,  $p < 0.001$ , with a large effect size (Cohen's  $d = 0.94$ ). Pairwise comparisons of marginal means revealed no significant changes during baseline for either of the groups, and increased self-compassion during the intervention for the intervention group only (mean difference  $T2-T3_1 = 0.55$ ,  $p < 0.001$ ). For anxiety, there was a large group-by-time interaction ( $F(2, 228) = 19.51$ ,  $p < 0.001$ , Cohen's  $d = 0.83$ ). Pairwise comparisons of marginal means showed that there were no significant changes during baseline for either of the groups, and a decrease in anxiety for the intervention group only (mean difference  $T2-T3_1 = -0.30$ ,  $p < .001$ ). For depression, there was a small group-by-time interaction ( $F(1.9, 216) = 4.55$ ,  $p < 0.001$ , Cohen's  $d = 0.40$ ). Pairwise comparisons of marginal means showed no change during baseline for either of the two groups, and a significant decrease in depression during the intervention period in the intervention group only (mean difference  $T2-T3_1 = -0.38$ ,  $p = 0.002$ ).

An intention-to-treat analysis with the last observation carried forward showed the same pattern of changes in self-compassion, anxiety, and depression as for the completers: significant changes during the self-compassion training for the intervention group only (Supplementary Information, section 8).

To summarize, self-compassion significantly increased during the course, while anxiety and depression significantly decreased.

#### *Changes over the entire study period for groups combined: Did changes in self-compassion and mental health remain at six-month follow-up?*

Groups were combined after the waiting list participants had been offered the intervention, and a series of repeated measures ANOVAs were conducted to examine whether changes remained at six-month follow-up in self-compassion, depression, and anxiety. The measurement time points were:  $T1$  = first baseline,  $T2$  = second baseline (i.e., during the last week pre-course),  $T3$  = post-course for both groups, and  $T4$  = at six-month follow-up.

*Self-compassion.* For self-compassion, there was a very large effect of time ( $F(2.3, 177) = 58.64$ , Cohen's  $d = 1.74$ ). Pairwise comparisons based on estimated marginal means showed that baseline means did not significantly differ, there were significant increases during the course ( $T2-T3_2 = 0.55$ ,  $p < 0.001$ ), and post-course and six-month follow-up means did not significantly differ. At six-month follow-up, the marginal mean scores were significantly higher than they had been at both baseline points, as expected (mean difference  $T1-T4 = 0.63$ ,  $p < 0.001$ , mean difference  $T2-T4 = 0.55$ ,  $p < 0.001$ ).

*Anxiety.* For anxiety also there was a large effect of time ( $F(2.5, 188) = 36.21$ , Cohen's  $d = 1.38$ ). Pairwise comparisons based on estimated marginal means showed that the baseline means did not significantly differ, there was a significant decrease during the course (mean difference  $T2-T3_2 = -0.32$ ,  $p < 0.001$ ), and there were no significant differences between post-course and six-month follow-up. At six-month follow-up, the marginal mean scores were significantly lower than they had been at both baseline points, as expected (mean difference  $T1-T4 = -0.38$ ,  $p < 0.001$ , mean difference  $T2-T4 = -0.34$ ,  $p < 0.001$ ).

*Depression.* For depression, there was also a large effect of time ( $F(3, 228) = 17.36$ , Cohen's  $d = 0.96$ ). Pairwise comparisons based on estimated marginal means showed that there were no significant differences between baseline means, significant decreases during the course (mean difference  $T2-T3_2 = -0.38$ ,  $p < 0.001$ ), and no changes between post-course and six-month follow-up. At follow-up, the marginal mean scores were significantly lower than they had been at both baseline points, as expected (mean difference  $T1-T4 = -0.53$ ,  $p < 0.001$ , mean difference  $T2-T4 = -0.52$ ,  $p < 0.001$ ).

Intention-to-treat analyses with the last observation carried forward ( $N = 158$ ) showed the same pattern of change as the analyses for the completers: significant change during the course that remained during follow-up. This indicated that changes observed in the completer sample were robust (Supplementary Information, section 9).

In summary, self-compassion increased during the intervention and remained higher than at the baseline points at six-month follow-up. Likewise, anxiety and depression decreased during the intervention and remained lower than at the baseline points at six-month follow-up.

*Did change in self-compassion correlate with changes in the other variables?*

Finally, to examine whether or not increases in self-compassion were associated with gains in the other outcome variables, a series of correlations were carried out using pre-post change scores (T2–T3). The results showed that increased self-compassion was associated with gains in personal growth self-efficacy ( $r = 0.43$ ,  $p < 0.001$ ) and healthy impulse control ( $r = 0.24$ ,  $p = 0.02$ ), and with reductions in self-judgment ( $r = -0.53$ ,  $p < 0.001$ ), habitual negative self-directed thinking ( $r = -0.51$ ,  $p < 0.001$ ), anxiety ( $r = -0.65$ ,  $p < 0.001$ ), and depression ( $r = -0.50$ ,  $p < 0.001$ ).

## DISCUSSION

The primary aim of this study was to examine the effect of a self-compassion course on two indicators of healthy self-regulation (personal growth self-efficacy and healthy impulse control), and two indicators of unhealthy self-regulation (self-judgment and habitual negative self-directed thinking). As expected, both indicators of healthy self-regulation increased during the course, and both indicators of unhealthy self-regulation diminished.

These results are consistent with research showing that self-compassion increases rather than decreases motivation to learn and to improve (e. g. Breines & Chen, 2012; Leary *et al.*, 2007; Neely *et al.*, 2009). The findings also correspond well with Smeets *et al.*'s (2014) finding of increased general self-efficacy after a short mindfulness intervention for students, and with Neff, Rude, and Kirkpatrick's (2007) finding in a cross-sectional study that growth self-efficacy (their term was personal initiative) was correlated with self-compassion.

At six-month follow up, scores remained high for personal growth self-efficacy, while the results were more complex for healthy impulse control. Although the mean scores for healthy impulse control remained higher than they had been immediately before the course (T2), they were not significantly different from the values on recruitment to the study (T1). Taking into consideration the relatively small effect size for the pre-post change in healthy impulse control, as well as the only moderate baseline correlation between healthy impulse control and self-compassion, one might speculate that self-compassion is more closely related to a sense of being able to influence one's life, as measured by the personal growth self-efficacy scale (e.g., 'I take charge of my life') than to inhibiting unwanted behavior, as measured by the healthy impulse control scale. Seven of the ten items on the healthy impulse control scale describe a failing to control unwanted behavior (e.g., 'I say inappropriate things' – reversed). During self-compassion courses, students are encouraged mindfully to acknowledge imperfections as part of being human, and to work toward growing in accordance with their values and goals. While behavior in the short run might conceivably be inhibited via unhealthy self-regulation tactics, such as self-judgment and habitual negative self-directed thinking, a self-compassionate stance might be more effective in kindly guiding oneself toward gradual and lasting change. Further studies are needed to explore this possibility.

As a secondary aim, we studied the effects of the course on self-compassion, anxiety and depression. We hypothesized that the course would lead to reductions in anxiety and depression, as

well as to increases in self-compassion. As expected, there was a reduction in anxiety and depression, and an increase in self-compassion; these changes remained at six-month follow-up. This is in line with earlier reports that self-compassion interventions may improve self-compassion and mental health in diverse samples (e.g., Arimitsu, 2016; Gilbert & Procter, 2006; Neff & Germer, 2013; Smeets *et al.*, 2014). Neff and Germer (2013) found that gains in self-compassion, mindfulness, and wellbeing after their eight-week mindful self-compassion program were maintained at six-month and one-year follow-up. The lasting effect of changes in anxious and depressive tendencies even after a short course, such as that conducted here, is encouraging.

Finally, the association between changes in self-compassion and the other outcomes suggest that self-compassion may facilitate (and be facilitated by) changes in self-regulation and mental health. Responding with self-compassion to common student mishaps (e.g., failing an exam or social rejection) may improve motivation to continue trying. Self-judgment and self-directed negative thinking are not heaped onto the hurt that has already been caused by the challenge, and anxiety and depressive symptoms may lessen.

We observed no harmful effects of the course. No students asked for assistance, although there was an extra therapist present during sessions and students could contact us between sessions. Students were asked to report any negative aspects of the course when completing their post-course online measurements. These responses requested changes, such as more sessions and shorter practice sessions; some wanted more and others wanted less discussion with other group members; no responses indicated harmful effects.

To the best of our knowledge, this is the first study to show that a short self-compassion intervention can favorably influence perceived self-regulation. Although there have been some experiments showing that increasing self-compassion may cause increases in healthy forms of motivation and responses (e.g., Breines & Chen, 2012; Leary *et al.*, 2007), most previous research in this area has been correlational and cannot be used as a basis for drawing conclusions about causality; furthermore, few studies have measured healthy self-regulation directly. Given the clear need for interventions addressing student psychological wellbeing, the results of this study are encouraging, as they clearly contradict the common prejudice that self-compassion leads to self-indulgence and is an obstacle to self-regulation, personal growth, and positive behavioral change. As both mindfulness and self-compassion are compatible with several models of counselling, the course can easily be combined with other approaches that have been shown to increase student resilience and mental health, such as cognitive behavioral approaches (Conley *et al.*, 2013).

### *Limitations and strengths of the study*

Several hypotheses and outcomes were tested in this study. This increases the risk of type I errors, but also the possibility of discovering results that fail to confirm the hypotheses. The participants were self-selecting students and most were female, so the results may not generalize to men or to less motivated groups. Moreover, the Norwegian student population may be more

homogeneous in terms of ethnicity and background than other student populations, so replication is called for. Other limitations are the lack of an active control group and reliance on self-report data. The use of multiple baselines to demonstrate that changes occurred after the courses started represents an asset of the current study. Other assets are the randomized design and the six-month follow-up.

## CONCLUSION

In summary, this randomized controlled trial shows that a short self-compassion intervention can increase students' self-compassion, enhance healthy forms of self-regulation, and improve their mental health. The results show that even short interventions have the potential to help students face the challenges of student life. Importantly, the study provides evidence against the prejudice that self-compassion reduces motivation and a sense of agency.

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Received 22 December 2016, accepted 3 June 2017

## SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's web site:

**Supplementary information:** Sections 1–9.