

Preface

This graduate thesis was conducted at the NTNU institute of psychology during the spring and autumn of 2015.

The idea for the thesis was a joint effort with our supervisor Stian Solem. We wanted to write about metacognitive therapy, and he proposed a study in which we compared ATT and mindful self-compassion. The intervention was performed solely by us, with good advice from Stian along the way. All SPSS-analyses was done by Stian, with us as avid spectators. We did all the writing, assisted by Stian's expert critiques along the way.

We would like to thank Stian Solem for his time and patience during our long meetings, lightning quick e-mail responses, feedback and motivation, and for having faith in us every step of the way.

We would also like to thank Greg Plitt for his motivating memes and speeches along the road to glory.

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Abstract

The Attention Training Technique (ATT) and Mindful Self-Compassion Program (MSC) are two promising psychological interventions for anxiety and depression. Metacognitive theory posits that an increase in attention flexibility via ATT will reduce depression and anxiety. Self-compassion theory posits that an increase in self-compassion will reduce depression and anxiety. It is still unclear how they compare to each other, and the effect they have on non-clinical participants. A three-week intervention trial was conducted in order to examine these issues. A sample of 40 non-clinical university students were randomly assigned to either a ATT group (n=19) or a MSC group (n=21). Homework was assigned between sessions. Both groups had significant reduction in symptoms of anxiety and depression, and a significant increase in mindfulness, attention flexibility and self-compassion. There was no significant difference between the groups on any of the measures. The results indicate that both ATT and MSC are viable options for increasing psychological well-being when used as a group-intervention over three weeks. The reduction in symptoms of anxiety and depression was associated with an increase in mindfulness, self-compassion and attention flexibility, regardless of intervention. This supports both metacognitive theory and self-compassion. As this was the first study to use ATT in a group setting over three weeks, and only the second to use MSC, more studies are necessary to validate their effects and to compare them to each other. Future studies should seek to replicate with a larger sample and follow-up measures.

Keywords: Attention flexibility, Self-Compassion, Group, depression, anxiety

Introduction

Anxiety and depression are among the most common psychological disorders today, afflicting around 16-28% of the population (Kessler et al., 2005). Specific psychotherapeutic treatments such as Cognitive Behavioural Therapy (Beck, 1979) for these disorders show significant short-term reduction in symptoms compared to treatment as usual (Butler et al., 2006), but only moderate long term effects (Steinert et al., 2014; Cuijpers, 2014). A better understanding of these disorders is important for developing more effective treatments. Metacognitive Therapy (MCT; Wells, 2011) and Mindful Self-Compassion (MSC; Neff & Germer, 2013; Neff & Dahm, 2014) are two promising models for understanding and treating anxiety and depression.

Metacognitive therapy is based on Wells' (2011) metacognitive model of emotional disorders, which has its theoretical foundation in the Self-Regulatory Executive Function theory of psychological disorder (Wells & Matthews, 1994). The model assumes that symptoms of anxiety and depression are the result of inflexible and recurrent thinking styles in response to negative thoughts, feelings and beliefs. These thinking styles are a part of the Cognitive Attentional Syndrome (CAS) that keeps the individual locked in processes of monitoring for threat, worry, rumination and coping behaviours which increases self-focused attention and impairs mental control.

The Attention Training Technique (ATT; Wells, 1990) is one of several techniques developed to counteract the CAS by promoting an external focus and increasing attentional flexibility (Wells, 2005). Evidence indicates that high attentional control enables the modulation of reflexive emotional responses, whereas low attentional control leaves the individual vulnerable to acting on dominant emotional tendencies that might be dysfunctional

(Derryberry & Reed, 2002). Spada et al. (2010) found that high attentional control was negatively correlated to state anxiety. Attention flexibility, which is a measure of attentional control, is strengthened in people receiving ATT (Nassif & Wells, 2014; Callinan et al., 2014).

ATT comprises a set of auditory stimuli (normally six to eight) presented simultaneously at different spatial locations over a period of 12 minutes. The patients are guided through sections of selective attention, attention switching and divided attention. Before listening to the tape, the patients are presented with a rationale for the technique. The rationale explicitly tells the patients that upsetting thoughts or feelings might occur and they should not try to stop or control them. They should treat them as «inner noise» and allow them to take care of themselves without any purposeful processing or appraisal. Homework practice of ATT is usually prescribed to strengthen metacognitive change.

ATT is used as part of metacognitive therapy (Wells, 2011), but has also shown to reduce depression and anxiety as a stand alone treatment. Wells & Papageorgiou (2000) performed a single-case series study on four patients with major depressive disorder. After a baseline period the patients received in-session ATT for five sessions in a period over five weeks and were given instructions to listen to the tape twice a day. The results showed clinically significant reduction in depression and anxiety. Similar results have been found when performed in groups. Fergus (2014) performed a group study where nonclinical participants received either ATT or Orsillo and Roemer's (2011) mindfulness-based progressive muscle relaxation (MB-PMR) in a single session intervention. Both groups showed significant reduction in anxiety, but likely via two different ways of attentional control; the ATT condition increased external focus and mindfulness training increased

internal focus. This was the first study which compared ATT and mindfulness, and the first study to explore group delivered ATT.

The overall goal of ATT is to attain more adaptive self-regulation in response to intrusive thoughts and feelings through increased attentional control and external focus (Wells, 2011). A related perspective on self-regulation is that of self-compassion which has been described as a useful emotion regulation strategy (Neff, 2003).

Mindful Self-Compassion (MSC) is a treatment program based on the concepts of self-compassion and mindfulness. Neff (2003) views self-compassion as a healthy form of self-acceptance. Its definition is closely related to the definition of compassion. Compassion involves being moved by the pain of others and opening one's awareness to their pain without avoiding or disconnecting from it. This opening allows feelings of kindness toward others to emerge, as well as a desire to help (Wispe, 1991). Self-compassion, therefore, involves being «...touched by ones own suffering and opening one's awareness toward one's own pain without disconnecting from it, and in turn generating the desire to alleviate one's suffering» (Neff, 2003).

According to Neff (2003), self-compassion comprises three interacting components: self-kindness versus self-judgement, a sense of common humanity versus isolation, and mindfulness versus over-identification when confronting painful self-relevant thoughts and emotions. Self-kindness is regarded as the ability to be caring and understanding toward oneself rather than being critical. When noticing an aspect of the self that is undesirable, so that maybe a feeling of «not-good-enough» emerge, self-compassionate self-talk is kind and supportive rather than harsh and berating. Similarly, when life circumstances are stressful, instead of immediately trying to control or fix the problem, a self-compassionate response

might be to first offer oneself comfort. The sense of common humanity in self-compassion involves recognizing that all humans are imperfect and have challenges. It also involves offering nonjudgmental understanding to one's pain and shortcomings, so that one's experience is seen as part of what it is to be human. And finally, mindfulness is an essential component of self-compassion. Mindfulness can be described as a mental state of openness, awareness and focus, and Kabat-Zinn defined it as a state of «non-judgemental attention to experiences in the present moment» (1990).

Even though mindfulness is a central part of self-compassion, the type of mindfulness that is part of self-compassion is narrower in scope than mindfulness in its traditional form. In self-compassion, mindfulness refers to balanced awareness of *negative* thoughts and feelings (Neff, 2014). For example, an item from the mindfulness subscale of the Self-Compassion Scale (Neff, 2003) is «When something upsets me I try to keep my emotions in balance». In traditional mindfulness, the idea is to pay attention to any experience whether it is negative, positive or neutral - and to stay in a non judging observing mode. In self-compassion however, the awareness is on the negative thoughts and feelings and the desire to change them. This is a paradox; at the same time that the experiencer is mindfully experiencing the present moment and accepting it without resistance, the wish for the experiencer to be free of suffering in future moments is also present (Neff, 2014).

The MSC program developed by Neff & Germer (2013) is specifically tailored to enhance self-compassion. It is applied to groups and teaches both formal (sitting meditation) and informal (during daily life) self-compassion practices (Neff & Germer, 2013). Neff & Germer's program lasts for 8 weeks with each session lasting around 2.5 hours. There are experiential exercises and discussion periods in each session in addition to homework

assignments to help participants learn how to be kinder to themselves. The formal practices centers around meditation exercises such as loving kindness meditation and affectionate breathing (Neff & Germer, 2013) and are presented as guided audiotapes. A study by Smeets et al. (2014) on nonclinical college students found that MSC was effective as a three week group intervention compared to training in time management skills. The MSC group significantly reduced rumination (medium effect size) and increased self-compassion, mindfulness, optimism and self-efficacy (large effect size). This suggests that a three-week intervention can be an effective low dose of MSC.

A meta-analysis by McBeth & Gumley (2012) on 32 studies found a large effect size between self-compassion and psychopathology ($r = -0.54$). They conclude that «...the measurement of self-compassion, predominantly via the Self-Compassion Scale (Neff, 2003), provides robust, replicable findings linking increased self-compassion to lower levels of mental health symptoms. Conversely, lower levels of self-compassion were associated with higher levels of psychopathology». These results apply to both clinical (Lockard et al., 2014) and nonclinical populations (Neff & Germer, 2013).

Although ATT promotes external focus of attention and the MSC and other mindfulness-based interventions promote increased internal focus, both treatments show similar reduction in anxiety (Fergus et al., 2014). Fergus et al. (2014) speculate that the function of self-focused attention may be context specific. This means that although increased self-focused attention is associated with psychological symptoms such as anxiety and depression (Ingram, 1990; Wells, 2011), it can be beneficial and actually decrease the same symptoms when performed within a mindfulness-based context (Baer, 2009). This makes both treatments viable options.

Another connection between the two constructs was found by Solem et al., (2015). Their study found that mindfulness and metacognition were related when comparing Metacognitions Questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004) and FFMQ (Baer et al., 2006). This indicates that both mindfulness- and metacognitive based treatments may affect similar measures.

In summary, both metacognitive and mindfulness-based interventions provide new perspectives on the treatment of psychological disorders through different approaches on self-regulation and focus of attention. Meta-analysis studies by Vøllestad et al. (2011), Hofmann et al. (2010) and Normann et al. (2014), suggest that both these perspectives may help to provide a better understanding of emotional disorders and improve the efficacy of treatments.

The aim of this study is to test the efficacy of group delivered ATT compared to MSC using nonclinical university students. In doing this, we aim to expand on the aforementioned studies by Fergus et al. (2014) and Smeets et al. (2014). Fergus et al. (2014) did not include measures of depression, and as they only had a single session intervention they could not include an analysis of potential dropout rates. Also, their measures of metacognition was restricted to a one-item marker of focus of attention and they had no measures for mindfulness. Smeets et al. (2014) had no specific measures of either anxiety or depression. By including these specific measures we wish to examine more thoroughly the evidence for the use of ATT and MSC on nonclinical participants and its use in group intervention over a three week trial. Also, by exploring the effectiveness of group delivered ATT and MSC we can increase our understanding of psychological treatment interventions and the constructs underlying them. Finding useful group interventions is of importance because it is more time- and cost efficient than individual interventions.

Based on the above theories (Wells, 2011; Neff, 2003) and studies (Papageorgiou & Wells, 2000; Fergus 2014; Smeets 2014; Neff & Germer 2013, Solem et al. 2015), we made the following hypotheses:

H1: both interventions will lead to a reduction in symptoms of anxiety and depression

H2: both interventions will increase mindfulness, attention flexibility and self-compassion.

Method

Participants

In order to recruit participants for the study, we put up flyers at two university campuses and promoted the study in a psychology lecture at NTNU (n = approximately 200). The study was presented as a 3-week course in stress-management. A total of 44 participants were recruited, of which 4 did not show at the first meeting and were excluded from the study. The total sample consisted of 40 undergraduate students from NTNU. Mean age was 22.4 ($SD=2.7$), the majority were female (73%) and 50% of the participants had a partner. These descriptive statistics are presented in table 1.

All participants completed the questionnaires (containing the measures described below) before the first meeting, using an internet survey. The students were randomized to one of two experimental groups (ATT or MSC) using the Research Randomize Program (www.randomizer.org). Until the first meeting, the participants were blind as to whether they were to receive ATT or MSC. The participant flow of the study can be seen in figure 1.

Figure 1.

Participant flow.

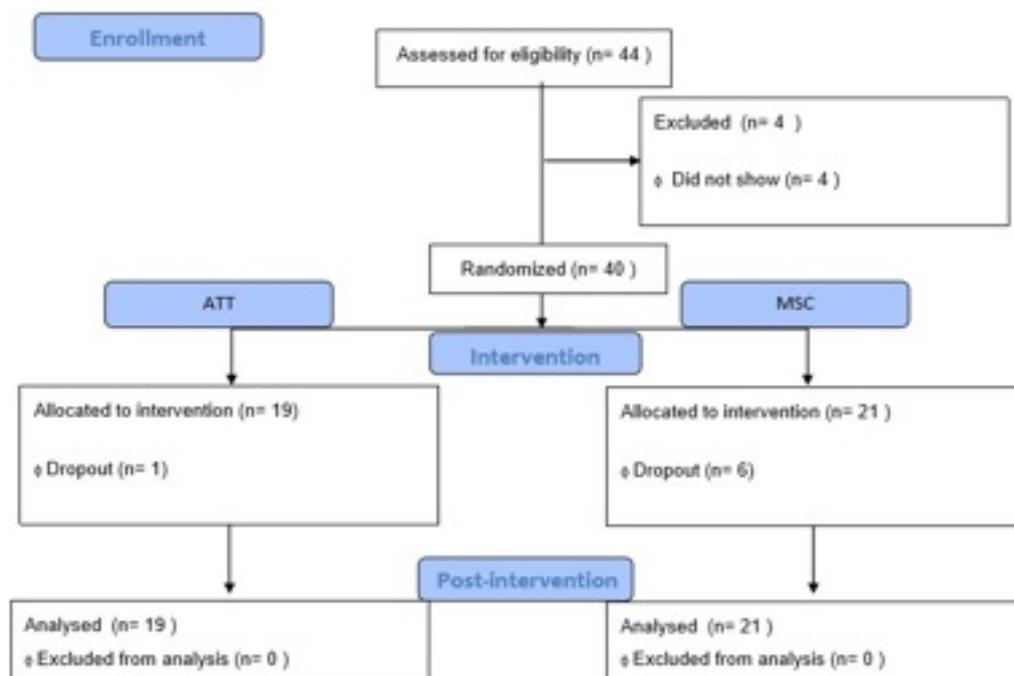


Figure 1. A flow chart showing the participant flow from assessment to analysis. ATT = Attention Training Technique; MSC = Mindful Self-Compassion. Last observation carried forward was used for dropouts.

Measures

In order to evaluate the participants' symptom level we included general measures on depression and anxiety. We also included more treatment-specific measures in order measure the constructs of mindfulness, self-compassion and attentional flexibility.

The Patient Health Questionnaire 9 (PHQ-9; Kroenke, Spitzer, Williams, & Löwe, 2010)

The PHQ-9 is a 9-item self-report questionnaire that screens for elevated depressive symptoms in the previous two weeks. Its reliability and validity are well documented (Kroenke, Spitzer, Williams, & Löwe, 2010). In this study we used it as a continuous measure

with scores ranging from 0 to 27 with cut-off scores of 5, 10, 15 and 20 representing mild, moderate, moderately severe and severe levels of depressive symptoms.

Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006)

GAD-7 is a 7-item self-report measure designed to screen for the presence of generalized anxiety disorder. Scores on the GAD-7 range from 0 to 21; Scores of 5, 10 and 15 represent mild, moderate and severe anxiety symptoms, respectively. The GAD-7 has demonstrated adequate validity, good clinical utility and generally strong psychometric properties (Spitzer et al., 2006).

The Five Factor Mindfulness Questionnaire (FFMQ; Baer et al., 2006)

FFMQ is a 39-item self-report instrument developed through factor analysis of a combined pool of items from five other mindfulness questionnaires. It consists of five facets of mindfulness: Observing («I notice the smells and aromas of things»), Describing («I am good at finding words to describe my feelings»), Acting with awareness («I find myself doing things without paying attention»), Non-judging of inner experience («I think some of my emotions are bad or inappropriate and I should not feel them») , and Non-reactivity to inner experience («I perceive my feelings and emotions without having to react to them»). Baer et al. (2008) found good internal consistency of the scales and other studies have found the questionnaire to be reliable and valid (Christopher et al., 2012).

To ease participant burden when answering the questionnaire, we used a shortened 20 item version of the FFMQ as suggested by a previous factor analysis study of the measure (Tran et al., 2014). We chose to report FFMQ as a total score based on the finding by Dundas et al. (2013) that FFMQ total score is significantly related to different indicators of psychological health.

Self-Compassion Scale Short Form (SCS-SF; Raes et al., 2011)

SCS-SF is a short form of the 26-item self-report instrument for measuring compassionate responding to oneself (Neff, 2003). It consists of six sub-scales measuring three components of self-compassion. The sub-scales are opposing pairs that constitute the components: self-kindness vs. self-judgement, common humanity vs. isolation, and mindfulness vs. over-identification. The scale demonstrates good construct validity and is significantly correlated with less depression and anxiety, as well as life satisfaction. The shortened 12 item version of the SCS has a near perfect correlation with the full scale when examining total scores (Raes et al., 2011). We decided to use this shortened version in order to ease the burden on the participants. We will only report on the total score, as the sub-scale scores are less reliable in the short form (Raes et al., 2011).

Detached Mindfulness Questionnaire (DMQ; Nassif & Wells, 2007)

DMQ is a 22 item measure that consists of five theoretically derived constructs of detached mindfulness: Attention flexibility, Meta-Awareness, Detachment/Observing Self, Thought Control, and Cognitive De-centering. These dimensions of metacognition are conceptualized as adaptive or maladaptive in the metacognitive model of psychological disorder. DMQ assesses participants' different levels of awareness and how they respond to their thoughts and requires participants to rate each item on a scale of 1–5 (1 = Disagree; 5 = agree). The overall reliability coefficients of this measure have been reported as acceptable (Nassif, 2009).

We included the DMQ to measure the sub-scale Attention Flexibility, which has been used in previous studies of ATT (Nassif & Wells, 2014; Callinan et al., 2014)

Intervention

After signing up to the study, the participants were given an online questionnaire that contained demographics and the measures described above. They were then randomized and put in either the ATT- or the MSC group. They were also informed that the course would run over three weeks, with one session a week.

At the start of the first meeting, all participants signed an informed statement that described the nature of the study. All sessions lasted approximately 45 minutes and were led by two 6th year graduate students in clinical psychology.

The first two sessions followed the same procedure in all groups:

1. Introducing the participants to their respective intervention condition (presenting the technique).
2. Practicing the technique (listening to an audio-tape; Well's attention training tape or Neff's affectionate breathing and loving-kindness tape. The tapes are available at <http://mct-institute.com/> (ATT) and <http://self-compassion.org/category/exercises/> (MSC).
3. Discussion of the exercise (attempting to understand the exercise and how it may be applied to everyday living).
4. Agreeing upon homework (practicing the technique between group meetings). We handed out forms where the participants could check off each time they had listened to a tape.

The third session was used for further discussing the principles the participants had learned. Most of the emphasis was on how the principles could be used in everyday life. The participants took turns in describing how they had experienced listening to the tapes, how they understood and related to the principles and constructs that were discussed in previous

session (for example “detached mindfulness” for ATT and “self-compassion” for MSC), and how they personally applied these principles to their life.

After this the experimenters facilitated a group discussion. The discussion sought to clear up any misunderstandings regarding the principles, and further emphasized how they could make use of the principles in the future.

The session ended with a short evaluation of the course and a brief statement from the experimenters reminding them about their rights according to data and anonymity.

ATT

The first session started by presenting the participants with the rationale for ATT. This was followed by a brief discussion in order to socialize the participants to the technique and make sure that the core concepts were understood. The participants then listened to Wells’ 12 minute audio-tape which guides them through five minutes of selective attention, five minutes of divided attention and two minutes of rapid attention switching. A voice guides the patients and tells them how to focus their attention and where to do it. The first 5 minutes they are asked to focus on different individual sounds (selective attention) and not be distracted by others. They are to treat other sounds as background noise and not pay them any attention beyond that. The voice reassures them that even though they fail to focus or if intrusive thoughts occur, this is normal and all they should do is re-focus on the given instructions. The next five minutes is rapid attention switching between individual sounds (and spatial locations) with increasing speed.

The final phase is 2 minutes of divided attention in which the patients are to expand the breadth and depth of attention and attempt to process multiple sounds and locations simultaneously. The tape was followed by feedback on their experiences. It was emphasized

that the technique was not to be used as an avoidance or coping strategy, as that could counteract adaptive processes. After listening, we had a discussion where the participants gave feedback on their experience of listening to the tape. Homework was assigned in the form of listening to the tape once a day until the next session.

The second session started with feedback from the participants and a short reminder of the rationale. A Norwegian translation of Wells' tape was used. After listening to the tape, we discussed how they experienced listening to the tape and answered any questions. Homework was assigned in the form of listening to the new tape once a day until the next meeting. In average, the participants in the ATT group listened to the tape 11.4 times ($SD=1.9$).

MSC

The main focus of the first session was on the general concept of mindfulness, such as breathing and staying in the moment-to-moment experience and accepting whichever thoughts and urges (such as moving) arrived. This was practiced by listening to Neff's Affectionate Breathing tape. Homework was assigned in the form of listening to the tape once a day until the next session. In average, the participants in the MSC group listened to the tape 8.5 times ($SD=2.3$). This is significantly less than the ATT group ($t_{[30]}=3.9, p=.001$). A split-plot ANOVA using homework as a covariate was run to test if number of homework exercises influenced outcome. Number of homework exercises did not significantly influence change in symptoms or attention flexibility, mindfulness and self-compassion.

The second session started with feedback from the participants, after which we gave a short repetition of some of the principles we had discussed in the previous meeting. We then introduced Neff's loving-kindness meditation tape. This was the first time we introduced the concept of self-compassion to the groups. After listening to the tape we had a general

discussion on self-compassion, exploring what the possible benefits of it may be and comparing it to self-esteem. Homework was assigned in the form of listening to the tape once a day until the next session.

Data analyses

An independent t-test was used to compare the two groups on demographics and measures before the intervention. To compare the two groups with respect to partner status a chi-square test was used. One participant (5%) dropped out from the ATT groups, and six (28%) from the MSC groups. For the dropouts, we used last observation carried forward. One participant from the MSC group lacked pre-data from DMQ and SCS. These missing values were not replaced.

Repeated measures analysis of variance (ANOVA) was used to examine changes in all measures after the intervention. To compare the two groups we used a split-plot ANOVA.

Results

Pre-intervention

There were no significant differences in age, gender or relationship status between the ATT and MSC groups before the intervention. The participants in the two conditions scored largely similar on PHQ-9, SCS-SF, DMQ and FFMQ, but the MSC groups scored significantly higher on GAD-7 as shown in table 1. However, when we used a Bonferroni correction, these differences were no longer significant. On PHQ-9, 60 % of the participants scored above the cut-off of 5.

Similarly, on GAD-7, 52.5% of the participants scored above the cut-off of 5. These descriptive statistics are presented in table 1.

Table 1.

Descriptive statistics.

	ATT	MSC	Total	T/χ^2	Sign
N	19	21	40		
Age	22.1 (2.5)	22.7 (2.9)	22.4 (2.7)	0.71	.48
Female gender	73% (14)	71% (15)	73% (29)	0.03	.87
Partner	53% (10)	47% (10)	50% (20)	0.10	.75
PHQ-9	5.4 (3.8)	7.7 (5.5)	6.6 (4.8)	1.56	.13
GAD-7	4.4 (2.2)	7.0 (4.5)	5.8 (3.8)	2.26	.03*
SCS-SF	36.2 (10.1)	35.3 (8.7)	35.7 (9.3)	0.30	.77
DMQ flexibility	16.8 (4.6)	14.0 (4.4)	15.3 (4.7)	1.94	.06
FFMQ	67.4 (11.3)	63.3 (8.1)	65.3 (9.8)	1.30	.20

Note. * = $p < .05$. ATT = The Attention Training Technique; MSC = Mindful Self-Compassion; PHQ-9 = The Patient Health Questionnaire 9; GAD-7 = Generalized Anxiety Disorder-7; SCS-SF = Self-Compassion Scale Short Form; DMQ Flexibility = Attention Flexibility from The Detached Mindfulness Questionnaire(DMQ); FFMQ = The Five Factor Mindfulness Questionnaire.

Post-intervention

The results suggested that significant improvements occurred following the intervention. There was a significant reduction in depressive symptoms (PHQ-9), showing a medium effect size with no significant difference between the groups. Anxiety symptoms (GAD-7) also had a significant reduction, with a medium effect size and no significant difference between the groups.

Both groups also had a significant increase in self-compassion (SCS-SF), attention flexibility (DMQ) and mindfulness (FFMQ), with large effect sizes. There was no significant difference between the ATT and MSC groups on any of the dependent variables. Table 2 summarizes the findings from the repeated measures.

Table 2.

Summary of repeated-measures analysis of variance (ANOVA) results.

	Pre-score Mean (SD)	Post-score Mean (SD)	<i>d</i>	Main effect		Between groups	
				Sig.	η_p^2	Sig.	η_p^2
PHQ-9 ATT	5.4 (3.8)	4.2 (3.7)	0.32	.001**	.255	.403	.018
PHQ-9 MSC	7.7 (5.5)	5.8 (5.8)	0.34				
GAD-7 ATT	4.4 (2.2)	3.5 (2.8)	0.36	.002**	.226	.365	.022
GAD-7 MSC	7.0 (4.5)	5.3 (4.4)	0.38				
SCS-SF ATT	36.2 (10.1)	41.2 (8.5)	0.54	.000**	.359	.718	.004
SCS-SF MSC	35.3 (8.7)	39.5 (8.9)	0.48				
Att.Flexibility ATT	16.8 (4.6)	18.7 (3.8)	0.45	.001**	.267	.637	.006
Att.Flexibility MSC	14.0 (4.4)	16.5 (4.2)	0.58				
FFMQ ATT	67.4 (11.3)	72.8 (9.7)	0.51	.000**	.420	.973	.000
FFMQ MSC	63.3 (8.1)	68.7 (10.1)	0.59				

Note. ** = $p < .01$. ATT = The Attention Training Technique; MSC = Mindful Self-Compassion; PHQ-9 = The Patient Health Questionnaire 9; GAD-7 = Generalized Anxiety Disorder-7; SCS-SF = Self-Compassion Scale Short Form; Att. Flexibility = Attention Flexibility from The Detached Mindfulness Questionnaire(DMQ); FFMQ = The Five Factor Mindfulness Questionnaire.

A closer look at the total sample indicate that the intervention was successful in decreasing symptoms of anxiety and depression. Scores below cut-off went from 40- to 65% on PHQ-9, and 47,5- to 60% on GAD-7. There was also a substantial decrease in participants reporting mild or moderate symptoms on both measures, as can be seen in table 3.

Table 3.

Symptoms pre- and post-intervention.

Cut-off	PHQ-9 PRE	PHQ-9 POST	GAD-7 PRE	GAD-7 POST
0-4 (No symptoms)	40.0%	65.0%	47.5%	60.0%
5-9 (Mild)	40.0%	25.0%	40.0%	32.5%
10-14 (Moderate)	12.5%	2.5%	10.0%	5.0%
> 15 (Severe)	7.5%	7.5%	2.5%	2.5%

Note. PHQ-9 = Patient Health Questionnaire-9; GAD-7 = General Anxiety Disorder-7.

Discussion

The aim of the study was to examine the efficacy of group delivered ATT compared to MSC using nonclinical university students. The results show that both groups had a significant decrease in symptoms of depression and anxiety, as well as a significant increase in mindfulness, attention flexibility and self-compassion. As far as the authors know, this is the first study where ATT and MSC serve as each others control, validating their individual effectiveness and showing that there was no significant difference between them.

As predicted by H1, both interventions were effective in significantly reducing symptoms of anxiety and depression. As only the second study to examine group-provided ATT, it further validates and expands on the results of Fergus et al. (2014), showing that short-term ATT in groups can be effective in not only reducing anxiety symptoms, but depression symptoms as well. As our study lasted through three separate sessions, we were also able to examine dropout-rates, something that was not possible in Fergus' single session study. Our

findings also validates and expands on the study by Papageorgiou & Wells (2000) where four single case patients with major depressive disorder received in-session ATT for five sessions in a period over five weeks. Their results showed clinically significant reduction in depression and anxiety. As our findings also show a reduction in these measures, it strengthens their findings, along with providing further support to Fergus et al. (2014) that ATT can be beneficial in a group-setting on a nonclinical sample.

Unfortunately, as Fergus et al. (2014) only reported on the significance level of their findings and Papageorgiou & Wells (2000) only reported scores on four individuals. Therefore we were not able to compare effect sizes.

Furthermore, our findings support and expand on Smeets et al. (2014) study on nonclinical university students ($n=49$) in using MSC as a short-term intervention. They found that participants in the MSC group had a significant decrease in rumination ($d=0.5$). Our findings expand on their results as we included specific measures of anxiety and depression, where both has a significant reduction with a medium effect size. This strengthens the study by Smeets et al. (2014), further indicating that a three-week intervention can be helpful in reducing anxiety and depression in nonclinical participants.

Our findings also support the original study on the MSC program by Neff & Germer (2013) on nonclinical participants ($n=23$). After a weekly 2-hour session over 8 weeks, the participants in the MSC group had a significant reduction in both anxiety ($d=0.83$) and depression ($d=1.30$). As both our study and the study by Fergus et al. (2014) only show a medium effect size in comparison to the large effect size found by Neff & Germer (2013), it is possible that a more extensive intervention is necessary in order to induce a large effect size for reduced anxiety. It must be noted that neither study used the same measures as we did, and

therefore it can be difficult to compare the difference in effect sizes. Although the results are promising, the issue of long-term effect remains.

Studies by Neff & Germer (2013) and Shapira & Mongrain (2010) suggest a robust long-term effect for MSC in general. To our knowledge, however, no studies have examined the long-term effects of a three week MSC intervention. More studies including follow-ups are needed. The long-term effect of ATT in general and specifically group-provided ATT has yet to be examined. As part of MCT, it has proven to have significant long-term effects in both individual (Wells & King, 2006) and group treatment (van der Heiden, 2014). Future studies should focus on ATT as a stand-alone treatment in order to validate these findings, given that ATT is only one of several components in MCT.

The dropout rates in our study was 28% for the MSC group and 5% for the ATT group. For an MBSR intervention, dropout rates are typically below 20% (Shapiro et al., 1998), no such data are currently available for MSC interventions. Some participants who received MSC reported that it was difficult to relate to the language used in the tapes, while most participants in the ATT group said that the technique was easy to relate to especially because of it's neutral language. These statements doesn't seem to infer on the overall outcome, however they should be noted as participants may be more likely to drop out from an intervention if they have a hard time understanding it or relating to it. The higher rates for MSC may be a reflection of the feedback we received. However, the pre-scores on PHQ-9 and GAD-7 revealed that some of the dropouts had the highest scores on these measures in the whole sample. Maybe they expected a more thorough treatment than the brief intervention we offered, and therefore dropped out. In addition to anxiety and depression, we also included measures of mindfulness, self-compassion and attention flexibility in order to examine how

the two interventions compared to each other and how they affect these measures in nonclinical participants.

As predicted by H2, both interventions led to significantly increased mindfulness, self-compassion and attention flexibility. Our findings that the ATT group had increased mindfulness post-intervention, support the study by Solem et al. (2015) who found that mindfulness and metacognition were related when comparing Metacognitions Questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004) and FFMQ. Even though Wells (2011) does not directly predict increased mindfulness as measured by FFMQ following ATT, Wells (2002) acknowledges that there are clear similarities between mindfulness and attention training. However, they differ in that attention training is based on a cognitive model of emotional disorder and that it does not require self-focused attention. As far as the authors know this is the first study using the measure of FFMQ on ATT, and further studies is necessary to provide valid evidence that increased mindfulness is achieved after receiving ATT.

The increase in attention flexibility supports previous studies by Nassif & Wells (2014) and Callinan et al. (2014). Nassif & Wells (2014) performed a study on nonclinical university students (n=42) with intrusive thoughts. After two sessions, between-groups ANCOVA show that the ATT group had significant increase in attention flexibility with a medium effect size compared to a control group. Callinan et al. (2014) performed a follow-up study and recruited nonclinical university students (n=29) with intrusive thoughts. Between-groups ANCOVA revealed that the ATT group had a significant increase in attention flexibility with a medium effect size following a single session intervention compared to a control group. The two studies mentioned above found significant between-groups effects, where as the two groups in our study combined for a large effect size with no significant

difference between them. Follow-up studies are necessary in order to validate these results, but they indicate that both ATT and MSC interventions are sufficient in creating a substantial increase in attention flexibility. The MSC group also had a significant increase in attention flexibility ($d=0.58$). Even though the specific measure of attention flexibility has not been used in previous studies on MSC, attention flexibility as measured by DMQ (Nassif & Wells, 2007) is similar to several aspects of mindful self-compassion (Neff & Germer, 2013) and mindfulness in general (Bishop et al., 2004). As our study was the first to use the measure of attention flexibility on MSC, more studies are required in order to understand how the MSC-program affects attention flexibility. A related study by Fergus (2014) found that ATT increased external focus of attention, and mindfulness-based progressive muscle relaxation (MB-PMR) increased internal focus of attention. This indicates that although both interventions in our study increased attention flexibility, it is possible they do so in different ways. Future studies should include a measure of direction of attention focus in order to better understand how the interventions achieve their effects. In addition to attention flexibility, there was also a significant increase in self-compassion for both groups.

The fact that the ATT group increased self-compassion can be explained by McBeth & Gumley (2012) findings that reduced anxiety and depression, which was the case in both groups, is linked to increased self-compassion. Their meta-analysis on 32 studies found a large effect size between self-compassion and psychopathology. Our study was the first to use a measure of self-compassion on ATT. More studies are necessary to provide evidence that ATT increases self-compassion and to examine how they relate to each other.

The significant increase in mindfulness and self-compassion by the MSC group in our study support the findings in previous studies (Neff & Germer, 2013; Smeets et al., 2014).

Neff & Germer (2013) found a significant increase in mindfulness ($d=0.8$) and self-compassion ($d=1.8$) for those who received MSC. Smeets et al., (2014) also found that those who received MSC had significantly increased self-compassion ($d=1.1$) and mindfulness on the measures of accept without judgement ($d=0.50$) and non-reactivity to inner experience ($d=0.8$). The effect sizes in our study were $d=0.48$ (self-compassion) and $d=0.59$ (mindfulness). Our effect size on mindfulness is comparable to the aforementioned studies, as all three show a medium to large effect size. Our medium effect size on self-compassion compared to the large effect size in the two other studies may indicate that three one our session over three weeks is not sufficient in creating a large effect size for the measure of self-compassion.

Limitations

The present findings must be considered in light of their limitations. Our sample was comprised solely of young university students similar in age. Thus, the study suffers from a homogenous sample, and doesn't allow the results to be generalized to a broader population. Further, the sample consisted of nonclinical participants. In order to validate group-provided ATT and MSC as treatments of psychological disorders, future studies should focus on clinical patients with specific disorders. The sample was comprised of 73% females which could possibly affect the results as it didn't allow us to exclude gender as a potential variable for change.

Our study was only the second to examine the effects of group-provided ATT, and the first to use it as a three-week intervention trial. This limits the strength of our findings, and the results can only be considered viable when replicated in futures studies. As only the second study to examine MSC as a three-week intervention trial, and the first to use one hour

sessions, future studies are necessary in order to show that this is an effective low-dosage of MSC.

Another significant limitation is the lack of follow-up assessment. The data was collected by self-report, which could be influenced by factors such as social desirability and how well the participants understand the questions. Future studies should include a diagnostic interview to validate and complement the self-report data. Further, the group-leaders had no official training in either of the two treatment methods. Although the sessions were mostly automatized and based around guided audio-tapes, this could have influenced the quality of the intervention.

Conclusion

With these limitations in mind, our results provide evidence for the efficacy of MSC and ATT in a group setting for a nonclinical sample. Our findings provide support for the theories supporting ATT (Wells, 2011) and MSC (Neff & Germer, 2013), and extends on previous research using these interventions by showing that they can be effectively used in a group-format as a three week intervention. The design we used is a cost-effective method for increasing well-being that can have a number of potential uses. It can be especially useful in settings where time and cost are of the essence or where people are naturally in groups, for example as stress-management courses at the work place or in schools.

Given that the results show similar effects for both ATT and MSC, one cannot be recommended over the other. It may be a matter of personal preference; for some the Buddhistic, more fleeting approach of self-compassion is appealing. Others may prefer the more neutral language and non-evaluative intervention provided by ATT.

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