



## “Trajectories and dynamic changes during and after mindfulness interventions”

Day: Friday 13th July 2018      Time: 9:00 – 10:15 am      Track: Working Mechanisms

Increasingly, research shows beneficial effects of mindfulness interventions on affect and mediators of these effects. Much less is known about the dynamic interplay between mindfulness, affect and mediators during and after a mindfulness intervention. The understanding of such dynamic processes of change is crucial in understanding how mindfulness leads to positive outcomes. Recently, researchers have started to examine these trajectories and dynamics of change more closely. In this symposium, we present four studies that focus on dynamic processes of change, thereby giving insight in how mindfulness affects mental states. All studies use daily diary methods to assess dynamic changes during or after a mindfulness intervention in affect and mindfulness and several other (mediating) variables, including (a) negative affect, perceived stress, and stress sensitivity (Snippe), (b) stress, rumination, and affect control (Vollbehr), (c) partner’s level of mindfulness (May), and (d) mindful attention and rumination (Nyklíček). The studied samples include (a) healthy adults during a mindfulness-based stress reduction (MBSR) training (Snippe, Nyklíček), (b) patients with mood and anxiety disorders before and after a mindful yoga intervention (Vollbehr), and (c) healthy adults during periods of meditation and non-meditation (May). Taken together, these studies provide important information regarding dynamic change processes during and after mindfulness interventions.



## Symposium overview

- Presenter 1**     **Evelien Snippe** - The course of change in stress, negative affect, and stress-sensitivity during mindfulness-based stress reduction
- Presenter 2**     **Ivan Nyklíček** - Daily mood during Mindfulness Based Stress Reduction: the role of momentary awareness and (ruminative) thinking
- Presenter 3**     **Christopher May** - Examining dynamic changes in individual and dyadic responses to a segmented mindfulness intervention
- Presenter 4**     **Nina Vollbehre** - Temporal dynamics of daily life stress, affect, and several cognitive variables before and after a mindful yoga intervention
- Chair:**             **Ruth Baer**



## **The course of change in stress, negative affect, and stress-sensitivity during mindfulness-based stress reduction**

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**Background and objectives:** Mindfulness-based stress reduction (MBSR) has been shown to reduce stress, Negative Affect (NA), and stress-sensitivity. Yet, little is known about how change in stress, NA and sensitivity to stress evolves over time; whether it occurs in linear or non-linear fashion and in which order. The first aim of this study was to examine the average shape of change in perceived stress, NA, and the decoupling between perceived stress and NA (i.e., stress-sensitivity) over the course of a MBSR program. The second aim of the study was to zoom in on individual courses of change in different aspects of NA as well as stress and to examine the timing of change.

**Methods.** Seventy-one adults from the general population participating in MBSR provided daily diary assessments of perceived stress and NA during MBSR. First, time-varying effect modeling (TVEM) was applied to examine how perceived stress, NA, and their interrelationship changed as a function of i) time in days and ii) days of mindfulness practice (N=71). Second, individual courses of change were mapped within individuals who provided at least 80% of daily assessments, had elevated levels of NA at baseline, and showed a decrease in NA over the course of treatment (N=6).

**Results.** TVEM indicated that, on average, perceived stress and NA decreased in a linear fashion rather than in a non-linear fashion, both over time and as a function of the cumulative number of days of mindfulness practice. The association between perceived stress and NA did not decrease over the course of MBSR on average. Individual change point analyses indicated that individuals differed in which aspects of NA and stress changed over time and in the timing of change.

**Discussion and conclusion.** The results suggest that there is a dose-response relationship between the amount of mindfulness practice and reductions in daily stress and NA. Yet, we did not find evidence that the coupling between stress and NA changed during MBSR. Finally, individual courses of change in aspects of NA and stress are not always linear and the timing of change differs between individuals.



## Daily mood during Mindfulness Based Stress Reduction: the role of momentary awareness and (ruminative) thinking

Ivan Nyklíček

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**Background and objectives:** Evidence for favorable effects of Mindfulness Based Stress Reduction (MBSR) on mood and psychological well-being is well established. Several potential mediating mechanisms for its efficacy have been proposed. However, empirical studies conducted in daily life of participants are scarce, while they may shed light on temporal dynamics of associations between potential mechanisms and outcomes. The aim of the present study was to explore the associations between mindfulness practice, momentary awareness, thinking, and mood during daily life of participants of MBSR. It was hypothesized that the positive effects of mindfulness practice on mood would be mediated by more accepting momentary awareness and less ruminative thought.

**Methods:** Consecutive MBSR participants were asked to complete momentary assessments eight times a day during the first and last week of MBSR. Assessments included their mental and physical activity, including ruminative and nonruminative thinking, mindfulness practice (long: > 20 min, medium: 7-20 min, or brief: < 7 min), and positive and negative affect.

**Results:** Preliminary analyses based on 24 participants showed that having performed a longer, but not shorter, mindfulness practice was associated with less thinking subsequently, both ruminative and nonruminative. Ruminative thinking mediated the association with less negative mood (coefficient  $-.03$ , 95% CI  $-.05 - -.01$ ), while nonruminative thinking mediated the association with less positive mood (coefficient  $-.08$ , 95% CI  $-.11 - -.05$ ). Although momentary awareness was also associated with mood (judgmental awareness with negative affect and accepting awareness with positive affect, it did not seem to be influenced by mindfulness practice.

**Discussion and conclusion:** Different mediating mechanisms may be involved in mindfulness effects on negative mood versus positive mood. Results suggest that sometimes nonruminative thinking, decreased after a mindfulness practice, may actually be associated with positive affect.



## **Examining dynamic changes in individual and dyadic responses to a segmented mindfulness intervention**

Christopher May

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**Background and objectives:** Research on mindfulness interventions have, to date, focused almost wholly on their effects for an individual practitioner. However, individual changes likely have interpersonal consequences. In the current study, we sought to determine if the effects of mindfulness meditation could be observed in non-meditating partners' daily reports of mindfulness and affect.

**Methods:** We recruited pairs of participants (both romantic partners and friends) reporting that they interacted with each other on a daily basis. Dyad members each answered daily questions assessing their mindfulness and affect for 8 weeks. We randomly chose one dyad member to receive training in mindfulness meditation. Over two distinct two-week periods, they were asked to meditate for 15-minutes per day. We hypothesized that dynamic changes between meditation and non-meditation periods of the study would be similar in direction (though differing in magnitude) for both the meditator and their non-meditating partner.

**Results:** Data from 35 dyads showed a number of longitudinal and interpersonal effects. Practitioners' mindfulness and affect fluctuated with periods of meditation and non-meditation. We also found that relationship partners' mindfulness and affect were linked to a practitioner's daily states. In particular, the negative affect of a non-meditating romantic partner was most strongly influenced by their partner's practice.

**Discussion and conclusion:** Mindfulness meditation had dynamic effects on both an individual practitioner and a close other. These results highlight the need to more thoroughly examine both the dynamic and the interpersonal effects of mindfulness interventions to assess their implications for personal and interpersonal well-being.



## **Temporal dynamics of daily life stress, affect, and several cognitive variables before and after a mindful yoga intervention**

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**Background and objectives:** Cognitive strategies in response to stressful events seem crucial in the onset of symptoms of depression and anxiety. Rumination and affect control are found to have a negative impact on symptoms of depression and anxiety, whereas mindfulness and body awareness are found to have a positive impact. Mindful yoga consists of a combination of exercise and meditative practices and thereby may be well-suited to treat mood and anxiety disorders. Initial studies have shown promising results for mindful yoga interventions, yet the exact mechanisms of change remain unclear. The present study examines whether the negative affective response to minor stressful events is reduced after a mindful yoga intervention and whether this goes together with a decrease in rumination and affect control and an increase in mindfulness and body awareness.

**Method:** We used a replicated single-subject time-series design. Twelve patients with (chronic) mood and anxiety disorders completed 15 days of 5 daily questionnaires before and after a 9-week yoga intervention. By means of time-series analyses, change in affect balance (mean negative and positive affect) pre- to post training was assessed for each participant. In addition, the within-person temporal associations between stressful events and affect balance, as well as rumination, mindfulness, affect control and body awareness for this association were studied pre- and post-training.

**Results:** Six out of twelve participants showed a significant increase in affect balance from pre- to post training. In four participants, the positive association between stressful events and rumination was reduced. In two participants changes were observed in the association between stress and mindfulness and mindfulness and affect balance. In two participants changes were observed in the association between stress and affect control and affect control and affect balance.

**Discussion and conclusion:** The results provided most support for reduced rumination after stressful events after a yoga intervention, thereby possibly preventing negative cycles between stress, rumination and negative affect. However, changes in this pathway were found for only some individuals, and a few other individuals showed changes in different pathways, while most participants showed no changes at all. This suggests heterogeneity in yoga-related mechanisms for improving affect.