# MINDFULNESS, ACCEPTANCE AND VALUE-BASED INTERVENTION FOR BURNOUT

## - Mediational roles of learning the elements of the intervention on outcomes

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## ABSTRACT

The effects of mindfulness-based interventions and ACT on mindfulness and well-being have received a lot of interest, and their mechanisms of change have been studied recently, but still some mechanisms are missing the research attention. The mechanisms of the change that happens during an intervention with people who suffer from work related burnout, have been examined by only a couple of studies. The present study aimed to investigate these mechanisms by looking at the mediating effects of learning mindfulness, acceptance and value-based working (MAV) skills which were measured with a novel Learning Questionnaire developed for the present research project. The data of the present study was driven from 88 participants who took part in the 8-week Muupu-program which is a mindfulness, acceptance and value-based intervention. Results, based on paired samples $t$-tests, showed that there were significant changes in mindfulness (FFMQ), frequency (ATQ-F) and believability (ATQ-B) of automatic negative thoughts, work ability (WAQ) and illegitimate tasks (BITS). Learning value-based working, or learning mindfulness, acceptance and value-based working in the context of work, partially mediated all of these changes except in illegitimate tasks. The explored new method assessing learning experiences of MAV related skills provided valuable information on the intervention and its strengths and possible weaknesses. This kind of assessment method could provide valuable information in future research on the progress of participants, the mechanisms of change, and the qualities of the interventions in question.


Keywords: Burnout; Mindfulness; Acceptance; Values; Learning; Mechanisms

# INTRODUCTION

The impacts of mindfulness interventions are often evaluated with well-known validated questionnaires of well-being's different aspects and with questionnaires estimating mindfulness skills. This has also been also done in the Muupu project which aims to enhance the well-being of people suffering from work related burnout. However, the participants were also asked how well they have learned the different elements of this specific intervention. With this kind of information it is possible to evaluate which parts of the intervention have had the most impact for possible changes in well-being and whether the estimation of learning by the participants relates to the scores of validated outcome measures. Mechanisms of change in interventions have been studied previously, but some areas in it are lacking. Within this study the mechanisms of change have been explored by analysing the mediating effect of participants' estimations of learning. This will especially advance the study of the mechanisms of value-based working and the study of mechanisms of change in a burnout intervention.

## Occupational Well-being

**Burnout.** Maslach, Schaufeli and Leiter (2001) have described burnout as a prolonged response to chronic emotional and interpersonal stressors at work which can be defined by three dimensions. *Exhaustion* is defined as feelings of emotional strain and reduced emotional resources, which results particularly from work overload. *Cynicism* (depersonalization) refers to an indifferent or disconnected attitude towards work and co-workers. *Inefficacy* shows as a reduced sense of personal accomplishment. (Maslach et al., 2001). In Finland 24.3% of women and 22.8% of men were experiencing mild burnout and respectively 2.6% and 2.3% severe burnout in 2011. The statistics were measured with Maslach's Burnout Inventory (MBI-GS) and no statistically significant differences were found between the two sexes or different age groups. (Suvisaari et al, 2012.)

**Work ability.** The concept of work ability has grown complex and many conceptualizations of it is being used in research. Lederer, Loisel, Rivard, & Champagne (2014) and Tengland (2011) have tried analyzing these differing explanations to derive some global consensus on the meaning of work ability. Lederer et al. come to the conclusion that researchers have no integrated concept of work

ability, but there seems to be a consensus that it is a relational concept resulting from the interaction of multiple dimensions. Tengland suggests dividing the concept into a *specific work ability* (in relation to one's normal or present job) and a *general work ability* (an ability most people have to perform in some kind of work).

Ilmarinen (2009) points out that work ability is differently conceptualized based on the context where it is being used. In occupational health the concept is often built on the balance between a person's resources and work demands (Ilmarinen, 2009). Within this study only the personal resources of the participants are assessed and discussed as they are from differing occupational backgrounds and the questionnaire used in this study to estimate work ability does not evaluate work environment. The questionnaire could be considered to measure a combination of specific and general work ability.

**Illegitimate tasks.** According to Semmer, Tschan, Meier, Facchin and Jacobshagen (2010) a task is *illegitimate* if it doesn't follow the norms of what can reasonably be expected from a person. Illegitimate tasks can be divided into two facets of *unreasonable* and *unnecessary* tasks. *Unreasonable* tasks require a person to do something that is not appropriate for them: it doesn't belong to their occupation or their level of expertise. A task is *unnecessary* if it shouldn't be done at all: it could've been avoided or done more efficiently, or it doesn't make sense. (Semmer et al, 2010.) Thus illegitimate tasks are largely dependent on the workplace and not on Muupu intervention's target of individual's qualities & well-being.

## Mindfulness, acceptance and value-based working

**Mindfulness.** *Mindfulness* has its roots in different Buddhist meditative practices, and can be defined as an emerging awareness through attending to the current moment and experience in a purposeful and non-judgmental way (Kabat-Zinn, 2003). To explain this further, Bishop et al. (2004) suggest that mindfulness can be divided into two sub-components: self-regulation of attention and orientation to experience. Self-regulation enables the maintenance of attention in the current experience, switching of attention, and inhibition of rumination, so that one can feel fully present in the moment. Orientation to experience is characterized by curiosity and acceptance toward an experience as an alternative to experiential avoidance, and it enables self-observation. (Bishop et al. 2004).

Individual levels of mindfulness may vary over time, and people can differ from each other in how mindful they are (Brown, & Ryan, 2003; Hülsheger, Alberts, Feinholdt, & Lang, 2013).

Mindfulness can be developed through practice (Kabat-Zinn, 2003), and mindfulness approaches including mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1982) and mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002) can be seen as a form of mental training (Bishop et al., 2004). There has been a lack of controlled trials in examining the effects of different mindfulness-based interventions, but Baer (2003) concludes in her review that these interventions may help to relieve medical and mental health problems like pain, anxiety and depression. Fortney, Luchterhand, Zakletskaia, Zgierska and Rakel (2013) found in their pilot study that taking part in an abbreviated MBSR course may reduce burnout among primary care clinicians. Mindfulness has also been shown to be inversely related to emotional exhaustion after work (Hülsheger et al., 2013).

**Acceptance and value-based working.** Acceptance and commitment therapy (ACT; Hayes & Smith, 2005) is based on relational frame theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001) where human language and cognition are seen as an ability to relate events to each other, guided by contextual control. In RFT psychological problems are seen as result of *psychological inflexibility*, which is caused by cognitive fusion and experiential avoidance.

*Psychological flexibility*, the ability to be fully present in the moment and to modify behavior to be in accordance with one's values, can be increased with the six core processes of ACT: acceptance, cognitive defusion, being present, self as context, values and committed action (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). According to Hayes et al. *acceptance* can be seen as a way to embrace events without changing them, to reduce experiential avoidance and to increase values-based action. ACT also contains various exercises to clarify one's *values*, and it encourages to value *committed action*, making concrete values consistent goals that can be achieved unlike abstract values (Hayes et al., 2006). ACT has been shown to be a promising treatment to various psychological conditions, effect size being moderate (Öst, 2008) or even better than cognitive behavioral therapy when looking at the primary outcomes (Ruiz, 2012).

ACT has been shown to reduce burnout among substance abuse counsellors (Hayes et al., 2004). Vilardaga et al. (2011) observed that experiential avoidance was strongly related to burnout among addiction counselors. Vilardaga et al. suggest that the increase in burnout can be a result of disconnection between values and everyday actions. They also found a considerable relationship between the lack of commitment to work-related values and burnout among addiction counselors.

**Measuring mindfulness and value-based working**

Several researchers have raised the concern that mindfulness as a concept and its operationalization have not achieved clear consensus between researchers or practitioners of mindfulness (e.g. Chiesa, 2013; Dorjee, 2010; Grossman, 2011; Hayes & Wilson, 2003). According to Grossman (2011) many popular mindfulness self-report questionnaires like Mindfulness Attention Awareness Scale (MAAS) and Five Facet Mindfulness Questionnaire (FFMQ) include items that measure psychological processes outside the original Buddhist rooted definition of mindfulness, and thus should not be stated as measures of mindfulness. Grossman also points out that studies have shown that different mindfulness questionnaires intercorrelate only modestly even though they all claim to measure mindfulness (e.g. Baer, Smith, & Allen, 2004; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Carmody, Reed, Kristeller, & Merriam, 2008).

Grossman (2011) also writes that many items on mindfulness questionnaires can be understood incorrectly without knowledge of mindfulness, and after receiving mindfulness training the answers may not be comparable to previous scores. Thus the level of expertise could affect accurate scoring in self-report questionnaires measuring the quantity of mindfulness. Overall, Grossman argues that current questionnaire definitions of mindfulness might impact mindfulness interventions and research adversely and block the opportunities that the original Buddhist mindfulness might offer when better integrated into western psychology.

Measuring value-based working (values clarification and values-committed action) has previously relied upon questionnaires that measure individual's values in different areas like family, work, education, and friendships (Wilson, Sandoz, Kitchens, & Roberts, 2010) or within self-chosen ones (Lundgren, Luoma, Dahl, Strosahl, & Melin, 2012). Trompetter et al. (2013) have constructed a new questionnaire (*Engaged Living Scale*, ELS) that measures an engaged response style from the framework of ACT, with two subscales of *valued living* and *life fulfillment*. It measures generally (not area specifically) value-based working and it can be easier included into large questionnaire packages. Trompetter et al. point out that the previous questionnaires have been valuable in clinical practice but make it difficult to compare scores between individuals and study the possible mediating effects of value-based working. However, there aren't yet published articles on research using this measurement from others than the original authors.

**Mechanisms of change**


The mechanisms of change in mindfulness interventions have been studied for only a couple of years. Gu, Strauss, Bond and Cavanagh (2015) have recently done a meta-analysis on the mediation studies of mindfulness-based interventions. They found strong evidence of cognitive and emotional reactivity, consistent and moderate evidence of mindfulness, worry and rumination, and preliminary evidence of self-compassion and psychological flexibility as mediators of change in clinical and non-clinical psychological outcomes. They also found that mindfulness, worry and rumination were significant mediators for the effect of mindfulness-based interventions on anxiety, depression, global psychopathological symptoms, stress, and negative affect.

ACT's mechanisms of change have been quite well studied (e.g. Forman, Chapman, Herbert, Goetter, Yuen, & Moitra, 2012; Gaudiano, Herbert, & Hayes, 2010; Lillis, Hayes, Bunting, & Masuda, 2009; Lundgren, Dahl, & Hayes, 2008; Wicksell, Olsson, & Hayes, 2011). However, there is a lack of studies on the mechanisms of value-based working compared to the other processes (Forman, Herbert, Moitra, Yeomans, & Geller, 2007; Pakenham, 2015). Lundgren et al. (2008) have studied the mediating effect of value-based working on increasing the quality of life of people suffering from epilepsy. Mediational significances were found on well-being, quality of life and total seconds of seizures per month with a combination of ACT processes of values attainment and persistence in valued action in the face of barriers. Carmody, Baer, Lykins and Olendzki (2009) found that values clarification was a partial mediator of a relationship between a combined mindfulness and reperceiving (*decentering, defusion, distancing*) variable and psychological symptom reduction. These findings suggest that values clarification and committing to valued behavior should be further studied as mediators of change.

The mechanisms of change in burnout interventions haven't been thoroughly researched yet (Hätinen, Kinnunen, Pekkonen, & Kalimo, 2007; Lloyd, Bond, & Flaxman, 2013). Job control served as a mediator for decreases in exhaustion and cynicism in a rehabilitation intervention (Hätinen et al., 2007), and Lloyd et al. (2013) found that psychological flexibility was a significant mediator between an ACT intervention and decreases in emotional exhaustion. Otherwise ACT or mindfulness interventions' mechanisms in treating specifically burnout haven't been studied yet. Therefore the question remains whether burnout as a clinical problem has different preferences when it comes to what's effective in an intervention. Lloyd et al. state that researchers should strive to learn more of these mechanisms, so that interventions could be more targeted and effective in treating people with burnout.

**Aim of the present study**


Like noted earlier, mindfulness-based interventions and acceptance and commitment therapy have previously been shown to reduce burnout. In the present study an intervention that combines mindfulness, acceptance and value-based working described before, and the effects of this intervention on people with work related burnout, were investigated. A new questionnaire (Learning Questionnaire of Muupu Intervention) was developed for this study in order to assess personal experience of learning the intervention's elements. The mediating effect of learning these elements on the possible changes in outcome measures could be analysed with factors derived from the Learning Questionnaire.

Thus this study tried to answer these two questions: (1) Are there significant changes in the outcome measures of mindfulness skills, automatic negative thoughts, work ability and perceived illegitimate tasks from pre- to post-intervention, and (2) are the changes in outcome measures mediated by factors derived from the Learning Questionnaire? Significant changes and mediating effects were expected in mindfulness, automatic negative thoughts and work ability, measures that gave extensive information on participants' development during the intervention. The present intervention didn't target on illegitimate tasks so those were neither expected to change during the intervention nor to be mediated by the factors, and were instead used to give information on the Learning Questionnaire's validity.

Another interesting part of this study was to see what kind of information these mediational effects give on the different elements of the intervention. This information can be used to preliminary assess what is effective in treating people with work related burnout, and what might not be that effective. It is also possible to use these results to roughly identify parts of the present study's intervention that were important in advancing well-being, and the parts that might benefit from further development.

**METHODS**


**Participants**


The present study is part of a KELA-funded (*the Finnish Social Insurance Institution*) research program called Muupu (www.muupu.jyu.fi) that aims to alleviate burnout symptoms, and advance coping skills for occupational challenges, via a mindfulness, acceptance and value-based program. The three-year-lasting research program began in March 2013. Voluntary participants were recruited in co-operation with occupational health systems as well as through internet and newspaper advertisement.

As inclusion criteria the participants had to have regular access to internet and a BBI-15 (Bergen Burnout Indicator) score at the 75 percentile or above (39-47 points) according to the Finnish population standardization (Näätänen et al., 2003), and they couldn't have on-going psychotherapeutic treatment. In addition to that, participation was not possible if applicant had a life situation, or physical or mental illness that prevented them from participating in the weekly meetings or doing daily home exercises. After screening with questionnaires and a phone interview for exclusion criteria, 216 voluntary participants were chosen and randomized into an intervention group and a TAU-group (treatment-as-usual in Finland).

Because this study targets the learning of the program's elements, the data used in this study will be only from a group of people who belong to the intervention group, weren't part of the pilot study (Learning Questionnaire was not included in their post-intervention inquiry) and who began answering to the pre-intervention inquiry. This mindfulness-group consists of 88 participants (see Table 1) who were in the beginning of the study 25 to 60 years old and working. Notable is that their average level of education is higher than that of the normal Finnish population.

TABLE 1. Characteristics of Mf-group

| Characteristics | Mf-group n = 88 | % |
|---|---|---|
| Age, mean (years) | 47.34 | |
| Age, classified (years) | | |
|    - 45 | 31 | 35.2 |
|   46 - 52 | 33 | 37.5 |
|   53 - | 24 | 27.3 |
| Gender | | |
|   Female | 70 | 79.5 |
|   Male | 18 | 20.5 |
| Education | | |
|   No Higher Education | 31 | 35.2 |
|   Higher Education | 57 | 64.8 |
| BBI-15, mean score | 56.83 | |

Note. BBI-15 = Bergen Burnout Indicator

**Intervention**

The mindfulness group took part in the 8-week Muupu-program which is a mindfulness, acceptance and value-based intervention (MAV; Kinnunen, Puolakanaho, Tolvanen, Mäkikangas, & Lappalainen, 2015). The intervention combines an approach described by Williams and Penman (2011) based on mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1982) and mindfulness-based cognitive therapy (MBCT; Segal et al., 2002) together with the value-based working elements of acceptance and commitment therapy (ACT; Hayes & Smith, 2005). The aim of the Muupu-program was to increase mindfulness skills, to develop an accepting and non-judgemental stance towards oneself and others, to clarify one's values and to encourage to value-based action.

     Participants were assigned to small groups of 6-10 people and each group met once a week for about two hours. These group meetings included working with the previous week's homework, introducing the main mindfulness practice and theme of the week, working with values or acceptance and reflecting on that exercise before discussing it in pairs and in the group, another mindfulness exercise, and finally receiving homework for the following week. The homework consisted of several weekly changing mindfulness and value-based working exercises and information, all found on the Muupu-website developed for the program. The exercises were encouraged to be completed daily.

The intervention was standardized and it was provided by two of the researchers in the Muupu-project having experience and education of the MAV intervention method. Participants completed measures online before and after the 8-week intervention, and as a part of the Muupu-program they were also sent individual feedback on their mindfulness skills, burnout experiences and evaluation of work conditions.

**Measures**

**Learning Questionnaire.** *Learning questionnaire of Muupu Intervention* (LQ; *see Appendix 1 and 2*) is a self-report measure constructed for the Muupu project by Anne Puolakanaho in 2013. It measures the learning of the different mindfulness, acceptance and value-based elements trained during the Muupu-program. The questionnaire contains 16 statements which are assessed on a five-level Likert scale (1 = *Not at all* and 5 = *Really well*) in relation to one's own situation before the program. For example: "I have learned to apply MF-skills into my everyday life" and "I have learned to clarify my view of my own work conditions". The sum of the scores from the original questionnaire ranges from 16 to 80.

An *exploratory factor analysis* (EFA) on the Learning Questionnaire yielded three factors. *MA Self* contains six items about learning mindfulness and acceptance skills in the context of self and everyday life. *MAV Work* includes four items about learning mindfulness, acceptance and value-based working in the context of work life. *Values* contains three items which relate to learning value-based working. Three questions from the original questionnaire were not included in the factors. Further details on why these items were excluded, and of the EFA, can be read in *Appendix 3: Exploratory Factor Analysis*. The mean of the variables' sums within each factor will be used for further analyses. LQ and *Values* showed excellent internal consistency, and *MA Self* and *MAV Work* showed good internal consistency (see Table 2).

Table 2. Characteristics & Standardized Alpha Coefficients of LQ
and its Subscales

|  | *M* | *SD* | *Alpha* |
|---|---|---|---|
| LQ | 3.55 | .58 | .939 |
| LQ-S | 3.51 | .58 | .922 |
| MA Self | 3.48 | .58 | .861 |
| MAV Work | 3.47 | .70 | .879 |
| Values | 3.61 | .81 | .929 |

Note: *M* = mean; *SD* = standard deviation; *Alpha* = Standardized Alpha
Coefficients; LQ = Learning Questionnaire; LQ-S = non-factor items
excluded

**Outcome measures.** *Five Facet Mindfulness Questionnaire* (FFMQ; Baer et al., 2006) is a self-report measure for the five subscales of mindfulness which are observe, describe, act with awareness, non-react and non-judge. There are 39 items in the questionnaire, and each item is assessed using five-level Likert scale (1 = *never or rarely true* and 5 = *very often or always true*). Some of the items are reversed. Observe, describe, act with awareness and non-judge subscales have eight items each, and get a score between 8 and 40 points. Non-react subscale contains only seven items, and gets a score between 7 and 35 points. Thus the entire score ranges from 39 to 195 points; the higher the score, the better mindfulness skills one has. FFMQ showed good internal consistency in the present study, pre-intervention $\alpha$ = .727 and post-intervention $\alpha$ = .713.

*Automatic Thoughts Questionnaire* (ATQ; Hollon, & Kendall, 1980) is a self-report measure for assessing the frequency of automatic negative thoughts associated with depression. There are 30 items and each item is assessed using five-level Likert scale (1 = *never* and 5 = *all the time*). The score ranges from 30 to 150 points, a higher score meaning that negative thoughts occur more frequently. In the present study also a revision of ATQ (ATQ-B; Zettle, & Hayes, 1986) was used to assess the believability of each automatic negative thought. ATQ-B can thus be considered to measure the process of defusion from thoughts. It contains the same 30 items as the original ATQ, and the items are again assessed with five-level Likert scale. The score is between 30 and 150 points; the higher the score, the more one believes in the negative thoughts. ATQ showed excellent internal consistency in the present study, pre-intervention $\alpha$ = .946 and post-intervention $\alpha$ = .962. Also ATQ-B showed excellent internal consistency in the present study, pre-intervention $\alpha$ = .962 and post-intervention $\alpha$ = .975.

*Work Ability Questionnaire* (WAQ) is a self-report questionnaire constructed for Muupu-project. The questions originate from a report made by Sipponen, Salmelainen & Syrjäsuo (2011, report ID S003/24.1.2011). The questionnaire consists of seven questions which assess: Ability to work in current job after two years, and current work ability in relation to previous best ability,

experienced health and stress states, recovery from work strain, and depression from two different aspects. Work ability is measured as a sum of these variables. The score ranges from 7 to 32, a bigger score meaning better work ability. WAQ showed good internal consistency in the present study, pre-intervention $\alpha = .732$ and post-intervention $\alpha = .791$.

*Bern Illegitimate Tasks Scale* (BITS; Semmer et al., 2010) is a self-report measure for assessing two facets of illegitimate tasks at work which are unnecessary tasks and unreasonable tasks. The questionnaire consists of 8 items, 4 for both facets. Each item is assessed using five-level Likert scale (1 = *never* and 5 = *frequently*), and both facets get a score between 4 and 20 points. The entire score is thus between 8 and 40 points, a higher score meaning more illegitimate tasks at work. BITS showed good internal consistency in the present study, pre-intervention $\alpha = .810$ and post-intervention $\alpha = .884$.

**Analysis Strategy**

Changes in outcome measures from pre- to post-intervention were measured with paired samples *t*-tests. Effect sizes were obtained using an online calculator by Daniel and Kostic (2015) where 0.2 indicates small effect, 0.5 moderate effect, and 0.8 large effect. Indirect test of mediation (Preacher, & Hayes, 2008) was used to calculate indirect effects of the pre-intervention measures on the post-intervention measures through the three factors derived from the EFA on Learning Questionnaire. Preacher and Hayes introduce a non-parametric method *bootstrapping* which doesn't require a normally distributed sample. Empirical approximation of the indirect effect's sampling distribution is constructed by sampling from the data set and estimating the indirect effect of each resampled data set for thousands of times. In this way 95 % bias corrected and accelerated confidence intervals can be built to assess the significance of the indirect effect. If confidence interval doesn't include zero, mediation is significant ($p \leq .05$). (Preacher, & Hayes, 2008).

**RESULTS**

**Preliminary analyses**

Seven participants didn't complete the Learning Questionnaire, so only the remaining 81 were included in the main analyses. In ATQ-B extreme outliers were brought inside three standard deviations. The means of the variables' sums were used in all analyses. Changes in outcome measures from pre- to post-intervention can be seen in table 3. Mean scores of FFMQ became significantly higher indicating that mindfulness skills got better during the intervention. Mean scores in both ATQ-F and ATQ-B were significantly lower indicating fewer negative automatic thoughts and believing in them less post-intervention. In WAQ the change was also significant, higher post-intervention scores indicating that participants' work ability got better. Also in BITS the change between pre- and post-intervention scores was significant indicating fewer illegitimate tasks at work post-intervention. However, it should be noted the significance of the change in BITS was low ($p <.05$) compared to other outcome measures ($p <.001$). In addition to that, effect sizes were large in FFMQ and moderate in ATQ-F, ATQ-B and WAQ, whereas in BITS effect size was only small. As can be seen in table 4, the pre-intervention scores of the outcome measures correlated significantly with each other, except for BITS. In the post-intervention measures a similar pattern was seen.

Table 3. Means and standard deviations, paired samples *t*-tests, and pre-post effect sizes for outcome measures, n=81

|  | PRE | | POST | | | |
|---|---|---|---|---|---|---|
|  | M | SD | M | SD | *t* | *d* |
| FFMQ | 3.21 | .45 | 3.54 | .39 | -6.55*** | .78 |
| ATQ-F | 1.87 | .52 | 1.57 | .49 | 6.48*** | .59 |
| ATQ-B | 1.71 | .48 | 1.42 | .44 | 6.28*** | .63 |
| WAQ | 3.05 | .56 | 3.46 | .56 | -7.16*** | .73 |
| BITS | 3.07 | .60 | 2.87 | .70 | 2.54* | .31 |

Note. M = mean; SD = standard deviation; FFMQ = Five Facet Mindfulness Questionnaire; ATQ-F = Automatic Thoughts Questionnaire Frequency; ATQ-B = Automatic Thoughts Questionnaire Believability; WAQ = Work Ability Questionnaire; BITS = Bern Illegitimate Tasks Scale; * $p <.05$, ** $< .01$, *** $p < .001$;
*d* = Cohen's d

Table 4. Correlation matrix of outcome variables, participant characteristics, Learning Questionnaire and the factors derived from it, n=81

| | Pre | | | | | Post | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | FFMQ | ATQ-F | ATQ-B | WAQ | BITS | FFMQ | ATQ-F | ATQ-B | WAQ | BITS |
| Age | **.239*** | -.158 | .000 | .059 | -.026 | .211 | .050 | .193 | -.114 | .002 |
| Gender | .073 | .050 | -.082 | .006 | .144 | **.232*** | -.072 | -.075 | .063 | .037 |
| Education | .093 | .001 | -.134 | .002 | -.050 | -.002 | .167 | .045 | -.079 | .093 |
| **Pre:** | | | | | | | | | | |
| FFMQ | - - | | | | | | | | | |
| ATQ-F | **-.549**** | - - | | | | | | | | |
| ATQ-B | **-.515**** | **.759**** | - - | | | | | | | |
| WAQ | **.331**** | **-.620**** | **-.547**** | - - | | | | | | |
| BITS | -.163 | .109 | .098 | -.133 | - - | | | | | |
| **Post:** | | | | | | | | | | |
| FFMQ | **.444**** | **-.235*** | **-.328**** | .091 | -.153 | - - | | | | |
| ATQ-F | **-.249*** | **.664**** | **.527**** | **-.367**** | .170 | **-.345**** | - - | | | |
| ATQ-B | -.148 | **.507**** | **.589**** | **-.252*** | .186 | **-.279*** | **.776**** | - - | | |
| WAQ | .043 | **-.421**** | **-.471**** | **.581**** | .112 | .205 | **-.616**** | **-.471**** | - - | |
| BITS | .062 | .135 | .187 | -.006 | **.379**** | -.177 | **.238*** | .200 | -.156 | - - |
| | | | | | | | | | | |
| LQ | .160 | -.194 | -.214 | .022 | **.245*** | **.494**** | **-.350**** | **-.261*** | **.393**** | .003 |
| LQ-S | .174 | -.198 | **-.219*** | .028 | **.234*** | **.498**** | **-.342**** | **-.261*** | **.384**** | .016 |
| MA Self | .109 | -.078 | -.086 | -.108 | .203 | **.426**** | -.163 | -.115 | **.237*** | .044 |
| MAV Work | .154 | -.213 | **-.232*** | .011 | **.255*** | **.362**** | **-.352**** | **-.259*** | **.333**** | -.015 |
| Values | .202 | **-.251*** | **-.282*** | **.227*** | .137 | **.508**** | **-.414**** | **-.339**** | **.460**** | .005 |

Note. FFMQ = Five Facets Mindfulness Questionnaire; ATQ-F = Automatic Thoughts Questionnaire - Frequency; ATQ-B = Automatic Thoughts Questionnaire – Believability; WAQ = Work Ability Questionnaire; BITS = Bern Illegitimate Tasks Scale; LQ = Learning Questionnaire; LQ-S = Shorter Learning Questionnaire, non-factor items excluded; * $p <.05$, ** $< .01$, *** $p < .001$

## Mediation analyses

Independent variables were the pre-intervention scores of FFMQ, ATQ-F, ATQ-B, WAQ and BITS. Dependent variables were the post-intervention scores of the same measures. The three factors of Learning Questionnaire (MA Self, MAV Work & Values) were used as mediators. As can be seen in table 4, participants' age correlated significantly with pre-FFMQ scores and participants' gender correlated significantly with post-FFMQ scores. Thus the participants' background variables of age, gender and education were controlled in the analyses.

Results of the mediation analyses can be seen in table 5. Only *Values* produced a significant mediating effect on the relationship between pre-FFMQ and post-FFMQ, and between pre-WAQ and

post-WAQ. Both *MAV Work* and *Values* produced a significant mediating effect between pre-ATQ-F and post-ATQ-F, and between pre-ATQ-B and post-ATQ-B. None of the mediators produced a significant mediating effect on the relationship between pre-BITS and post-BITS, though when looking at table 4, it is notable that post-intervention BITS scores did not correlate with any of the factors in the first place. Mediation analyses were later computed with the original LQ and the shortened version LQ-S as mediators as well, but they produced a significant mediating effect only on the relationship between pre-ATQ-F and post-ATQ-F.

Table 5. Indirect effects of pre-intervention measures on post-intervention measures through MF Self, MF Work, Values, LQ and LQ-S; age, gender and education controlled, n=81.

| Independent variable | Dependent variable | Mediator | $a$ | $b$ | $c$ | $c'$ | $ab$ | CI$_{lower}$ | CI$_{upper}$ | $p$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Pre-FFMQ | Post-FFMQ | | | | | | | | | |
| | | MA Self | .08 | .25*** | .32*** | .30*** | .018 | -.048 | .087 | ns |
| | | MAV Work | .18 | .15* | .32*** | .29** | .030 | -.025 | .108 | ns |
| | | Values | .38 | .21*** | .32*** | .24** | .081 | .004 | .177 | ≤.05 |
| | | LQ | .16 | .29*** | .32*** | .27** | .048 | -.028 | .121 | ns |
| | | LQ-S | .18 | .29*** | .32*** | .27** | .052 | -.026 | .136 | ns |
| Pre-ATQ-F | Post-ATQ-F | | | | | | | | | |
| | | MA Self | -.10 | -.09 | .66*** | .65*** | .006 | -.012 | .069 | ns |
| | | MAV Work | -.31 | -.15* | .66*** | .62*** | .044 | .001 | .129 | ≤.05 |
| | | Values | -.45** | -.13* | .66*** | .60*** | .054 | .019 | .130 | ≤.05 |
| | | LQ | -.24* | -.18* | .66*** | .62*** | .040 | .002 | .121 | ≤.05 |
| | | LQ-S | -.24* | -.17* | .66*** | .62*** | .037 | .004 | .120 | ≤.05 |
| Pre-ATQ-B | Post-ATQ-B | | | | | | | | | |
| | | MA Self | -.07 | -.07 | .56*** | .56*** | .004 | -.012 | .053 | ns |
| | | MAV Work | -.32* | -.09 | .56*** | .53*** | .030 | .001 | .098 | ≤.05 |
| | | Values | -.47* | -.09 | .56*** | .52*** | .040 | .004 | .119 | ≤.05 |
| | | LQ | -.24 | -.12 | .56*** | .53*** | .027 | -.002 | .103 | ns |
| | | LQ-S | -.24 | -.12 | .56*** | .53*** | .028 | -.003 | .106 | ns |
| Pre-WAQ | Post-WAQ | | | | | | | | | |
| | | MA Self | -.11 | .33*** | .60*** | .64*** | -.038 | -.146 | .037 | ns |
| | | MAV Work | .02 | .28*** | .60*** | .60*** | .004 | -.077 | .077 | ns |
| | | Values | .35* | .23*** | .60*** | .52** | .081 | .013 | .184 | ≤.05 |
| | | LQ | .03 | .40*** | .60*** | .59*** | .012 | -.089 | .099 | ns |
| | | LQ-S | .04 | .39*** | .60*** | .59*** | .012 | -.086 | .100 | ns |
| Pre-BITS | Post-BITS | | | | | | | | | |
| | | MA Self | .16 | -.05 | .44*** | .45*** | -.010 | -.131 | .028 | ns |
| | | MAV Work | .26* | -.13 | .44*** | .48*** | -.034 | -.197 | .021 | ns |
| | | Values | .13 | -.03 | .44*** | .45*** | -.004 | -.090 | .024 | ns |
| | | LQ | .19 | -.12 | .44*** | .47*** | -.025 | -.202 | .016 | ns |
| | | LQ-S | .18 | -.10 | .44*** | .46*** | -.020 | -.200 | .020 | ns |

Note. FFMQ = Five Facets Mindfulness Questionnaire; ATQ-F = Automatic Thoughts Questionnaire Frequency; ATQ-B = Automatic Thoughts Questionnaire Believability; WAQ = Work Ability Questionnaire; BITS = Bern Illegitimate Tasks Scale; LQ = Learning Questionnaire; LQ-S = Shorter Learning Questionnaire, non-factor items excluded; $a$ = direct effect of independent variable on mediator; $b$ = direct effect of mediator on dependent variable; $c$ = total effect of independent variable on dependent variable; $c'$ = direct effect of independent variable on dependent variable, $ab$ = indirect effect of independent variable on dependent variable through proposed mediator; CI = 95 % bias corrected and accelerated confidence intervals of independent variable on dependent variable through proposed mediator; * $p < .05$, ** $p < .01$, *** $p < .001$; ns = not significant; number of bootstraps = 5000

**DISCUSSION**

One of the aims of this study was to investigate if there were significant changes in the outcome measures from pre- to post-intervention. Changes were expected in mindfulness (FFMQ), frequency (ATQ-F) and believability (ATQ-B) of automatic negative thoughts, and work ability (WAQ) whereas illegitimate tasks (BITS) measuring working conditions were neither this intervention's target nor expected to change during it. Results showed that there were significant changes in all of the outcome measures. Participants' mindfulness skills got better, they had fewer automatic negative thoughts, and they believed less in those thoughts. Participants' work ability got better and they perceived fewer illegitimate tasks at work. Effect size was small in illegitimate tasks compared to large or moderate in other outcome measures, and correlation analysis also indicated that illegitimate tasks was a separate construct from mindfulness, automatic negative thoughts and work ability. Thus it was surprising that there actually was a significant change in illegitimate tasks. It is possible that participants began to perceive their tasks differently and that affected the reported amount of illegitimate tasks post-intervention.

It looks like the MAV intervention (Kinnunen et al., 2015) combining the mindfulness, acceptance and value-based working elements of MBSR (Kabat-Zinn, 1982), MBCT (Segal et al., 2002) and ACT (Hayes & Smith, 2005) can have positive effects on mindfulness and well-being, which supports the findings made previously of the effectiveness of mindfulness-based interventions (Baer, 2003) and ACT (Öst, 2008; Ruiz, 2012) although looking at the results of the present study it should be remembered that no comparison to a control group was made.

The second aim of the present study was to investigate if a significant amount of variance in changes in the outcome measures from pre- to post-intervention could be explained with factors *MA Self, MAV Work and Values* derived from the Learning Questionnaire (LQ) that was developed for the Muupu-project. They were expected to mediate all of the outcome measures, except for illegitimate tasks. *Values* proved to be a significant mediator in work ability, mindfulness, and the frequency and believability of automatic negative thoughts. *MAV Work* was a significant mediator in the frequency and believability of automatic negative thoughts. Surprisingly, *MA Self* didn't prove to be a significant mediator in any of the outcome measures, not even in FFMQ. As expected, illegitimate tasks wasn't mediated by any of the factors.

**Implications.** It would seem that learning value-based working (*Values*) explained the changes that happened during the intervention in the most extensive way. It was the only factor to mediate the

increase in work ability and mindfulness. This suggests that value-based working was more effective in this burnout intervention than learning mindfulness or acceptance, which have been established as mediators of change in mindfulness and ACT interventions respectively (Gu et al., 2015; Forman et al., 2012; Lillis et al., 2009; Lundgren et al., 2008). The few studies examining the relationship of values clarification and committing to value-based action with outcome measures have also found significant mediation through these processes (Carmody et al., 2009; Lundgren et al., 2008).

The fact that learning value-based working had such a significant effect compared to the other elements could be because Muupu-program included several value-based working exercises that were also reflected and discussed in the group sessions (for the description of the Muupu-program, see *Methods*). Value-based elements could have been seen as more concrete and participants could easily perceive their progress and results gained by working with them.

The context of burnout might have also affected the impact of value-based working on the well-being of participants if they made significant changes in their life conditions thanks to them. Vilardaga et al. (2011) have previously found a relationship between the lack of commitment to work-related values and burnout, and they have suggested that the increase in burnout can be a result of disconnection between values and everyday actions. It might well be that value-based working has a strong effect on populations with burnout.

Since the impact of value-based working on changes in outcomes has been scarcely studied (Forman et al., 2007; Pakenham, 2015), these findings implicate that these mechanisms should be further researched. Future studies should assess the Engaged Living Scale constructed by Trompetter et al. (2013) and use it to more thoroughly investigate the significance of working with values in burnout and other interventions.

Learning mindfulness, acceptance and value-based working in the context of work (*MAV Work*) didn't mediate work ability significantly. However, work ability has been suggested to result from the interaction of multiple dimensions (Lederer et al., 2014), whereas WAQ assessed only one dimension (the psychological aspect) of it. The concept of work ability wasn't defined in the questionnaire which might have led to people answering with very varying notions of work ability in mind when asked to for example directly rate their current work ability. It should also be noted that the Muupu project was the first one to use the WAQ measure, so it has not been validated previously. It might be that it simply didn't take into account the complex multi-dimensional nature of work ability well enough or was not able to differentiate the individual progress of the participants.

MAV Work did partially mediate the change in the frequency and believability of automatic negative thoughts. The amount of automatic negative thoughts tells about one's well-being especially in regard to depressive symptoms. The fact that MAV Work mediated the decrease in ATQ-F means

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that these elements had a significant role in increasing the well-being of the participants. ATQ-B measures how much a person believes in their automatic negative thoughts, which could be considered to measure *cognitive defusion*: having a distance to your thoughts and not automatically believing them. According to relational frame theory (Hayes et al., 2001) cognitive fusion causes psychological inflexibility which is thought to cause psychological problems. Lloyd et al. (2013) found that psychological flexibility was a significant mediator for decreasing emotional exhaustion with an ACT intervention. Thus the fact that MAV Work mediated the decrease in ATQ-B encourages the importance of these elements in a burnout intervention.

It would seem that learning mindfulness and acceptance in the context of work seemed to explain the results better than learning them in the context of self and everyday life (*MA Self*). However, MAV Work did also contain a value-based working item contributing to the effect. It might be that because the participants had a high burnout score in the beginning of this intervention, mindfulness and acceptance targeted on the context of working life had a larger impact on their well-being. The mediating effect of psychological flexibility in decreasing emotional exhaustion (Lloyd et al., 2013) indicates that acceptance and mindfulness are indeed effective in treating burnout, since these processes increase psychological flexibility (Hayes et al., 2006). The mediating effects of MAV Work affirm that targeting intervention content to the context of work with people suffering from burnout is an effective method.

Interestingly MA Self or MAV Work were not significant mediators for the change in FFMQ which is supposed to measure the amount of mindfulness. With these results it is tempting to question if FFMQ is truly measuring the increase in mindfulness. However, the lack of mediation also raises questions on whether LQ and the factors were able to differentiate learning mindfulness from the other aspects of the intervention. Mindfulness didn't have a factor of its own, it was always combined with acceptance or also with a value-based working item in MAV Work. More mediating effects might have been found with clearer LQ items, resulting in mindfulness comprising a factor of its own, or with different outcome measures assessing other areas of well-being or psychological processes, like burnout or acceptance.

It is also possible that LQ and the factors weren't able to measure the process that people have in relation to mindfulness and their well-being. Keune and Forintos (2010) found in their study that the endeavor to be mindful in everyday life across different situations was associated with higher well-being. Thus for mindfulness to have a more substantial impact on well-being it needs to be regularly used in everyday life across all situations. LQ contained only one item (*see Appendix 1 and 2*) measuring this: "I have learned to apply MF-skills into my everyday life", whereas FFMQ as a whole measures the frequency of acting in a mindful way. Thus people that assessed having learned

mindfulness well might have been lacking on the part of integrating it into their lives and LQ wasn't able to measure this issue that divides the participants on how learning mindfulness has affected their well-being.

Finally, when looking at the entire LQ and the shortened version of it, they mediated only the frequency of automatic negative thoughts. Because the factors derived from LQ did produce several significant mediating effects, it looks like dividing LQ into factors was important, providing information on how the different elements of this intervention worked separately.

**A new method of assessment**

Often interventions' impacts on participants are estimated by measuring the amount of a trait, state or skill with a questionnaire before the intervention, then targeting intervention content to enhance these measured concepts, and finally measuring the new amount of the said trait, state or skill with the same questionnaire. This change in the scores is then seen to be at least partly impacted by the intervention and considered a measurement of the progress by participants.

In this study a different method of assessing progress was explored. Instead of only comparing pre- and post-intervention scores, the participants also rated on a questionnaire how well they themselves thought they had learned the content of the intervention. An important thing to note here is that they were asked to do this in relation to their skills prior to the intervention. This way the questionnaire measures only the change happening during intervention, not allowing prior skills to contribute to the score. This can for example eliminate the problem of a questionnaire not being able to show differences in the amount of mindfulness pre- and post-intervention if the scores were high to begin with. The Learning Questionnaire purely asks how well one feels like s/he has learned mindfulness, acceptance and value-based working during the intervention. Grossman (2011) raised a concern on how accumulated knowledge of mindfulness affects ratings in mindfulness questionnaires and if the scores can be truly compared to one another. With the LQ it does not matter if participants did not understand mindfulness prior to the intervention: they assessed their learning after getting to know all the info.

LQ doesn't assess the amount of learning objectively, it taps straight into how the participants feel about their own progress. Even if a person assesses their learning as having been substantial, someone else in the same situation might not rate the changes in their skills similarly. However, a person's well-being derives from their own assessments of themselves and their life situations,

therefore it is not futile to measure plainly their own views on their progress. It is also interesting to compare this experienced learning to the changes shown by outcome measures. Personal assessments of learning might even have a better connection to the actual changes well-being than trying to measure the amount of skills as objectively as possible.

As previously seen, it has been possible in this study to assess if learning certain elements of the intervention had more impact on well-being than learning other elements, and if some of them could be developed further to facilitate more effective targeting on the clinical problem. MA Self was not found to mediate any of the outcomes in this study. These results indicate that in the future it might be beneficial to further assess and develop the mindfulness and acceptance exercises (in the context of self and everyday life) in the Muupu-intervention in order to enable more effective targeting of these elements to the problems related to burnout and increase the effect of the intervention overall. The results in this study also indicate that value-based working elements were highly beneficial for people suffering from burnout and therefore they should be kept as an important part of the program.

**Implications.** To our knowledge previous studies haven't used an assessment method like LQ in their studies. It is not a common practice to include questionnaires on learning the content of the intervention in question. This kind of method could yield important additional information on the progress of participants, how the different parts of an intervention are learned, and how big of an impact they have on the measured outcomes. As discussed previously, the mechanisms of mindfulness and ACT interventions have been studied (Gu et al., 2015; Forman et al., 2012; Gaudiano et al., 2010; Lillis et al., 2009; Lundgren et al., 2008; Wicksell et al., 2011), but there are still parts and processes that need more research attention (Forman et al., 2007; Pakenham, 2015), especially when it comes to burnout interventions and their mechanisms (Hätinen et al., 2007; Lloyd et al., 2013). Intervention specific measures, like LQ, could be used to address these shortages in collaboration with established outcome measures to shed more light on the mechanisms of interventions.

However, this method requires attention and effort since it has to be built for every intervention specifically. If enough thought is not put into the layout of the questions, it might be possible that the questionnaire will not able to capture the processes happening during the intervention. With LQ in this study it is possible that questions on values were well-defined and easy to differentiate from the other content of the intervention, which also shows on the results of the EFA on LQ and the resulting factor structure.

With the data from LQ it would have been also possible to look at how well different parts of the intervention were learned and what kind of differences there were between learning them. The present study concentrated on using the info gathered with LQ on seeing its connections to the

outcome measurements and changes in the well-being of the participants. In future studies the other potentials of this assessment method could be explored as well. The information on the amount of learning different parts of the intervention would give further information on enhancing and modifying an intervention or advancing its effective targeting.

**Limitations**

It should be noted that most of the participants in the present study were women (80 %) and as much as 65 % had higher education. However, these variables along with age were controlled in the mediation analysis. Also, as pointed out before, no comparison to a control group was made. Significant burnout (BBI-15 score at the 75 percentile or above) was one of the inclusion criteria so it is difficult to generalize the findings of this study to populations without burnout. On the other hand, in many studies the effects of mindfulness-based interventions or Acceptance and Commitment therapy on burnout have been investigated among healthcare personnel only (e.g. Fortney et al., 2013; Hayes et al., 2004; Vilardaga et al., 2011), whereas in the present study participants had differing occupational backgrounds, which makes it easier to generalize these findings to people suffering from work related burnout no matter what their profession is.

It should also be remembered that LQ was developed for the Muupu-project and thus hasn't been validated before. In the present study BITS that measures illegitimate tasks, or more generally work conditions, was used to see if LQ mediated the constructs it was proposed to mediate. As it turned out, participants did perceive less illegitimate tasks at their work post-intervention, but learning Muupu-intervention and its elements didn't explain this change at all, whereas the changes in other measures were partially explained by at least one of the elements. This supports the idea that LQ measures what it was constructed to measure. On the other hand, as discussed before, the fact that MA Self and MAV Work didn't mediate the changes in mindfulness or work ability raises questions about LQ's validity.

One of the limitations is also the possibility of participants wanting to answer in a socially desirable way. For example, Brown and Ryan (2003) found in their study a relationship between self-reported mindfulness and social desirability, although social desirability didn't seem to change the significance of the association of mindfulness with well-being. In LQ participants were asked about the learning of Muupu-intervention with rather obvious questions, so it was quite easy to modify one's answers purposefully. One reason for this can be as simple as pleasing the researchers, but

another aspect Grossman (2011) points out is actually participants' possible need to see changes after spending their resources on the intervention and its exercises.

**Conclusions**

In conclusion, our findings demonstrate that there were significant changes in mindfulness, automatic negative thoughts, work ability and perceived illegitimate tasks at work following the 8-week Muupu-program which is a mindfulness, acceptance and value-based intervention (MAV). In addition to that, these changes except for illegitimate tasks were partially mediated by learning at least one of the intervention's elements. In the present study learning value-based working seemed to explain the changes the most. There were also findings suggesting the strength of targeting intervention content on the context of work in a burnout intervention.

With these results it was possible to assess the strengths and possible weaknesses of the intervention in regard to which elements had an effect on outcomes. This provides valuable information for potential further development of the intervention. Another strength of the present study was a new way of assessing the development of mindfulness, acceptance and value-based working. The Learning Questionnaire provided a way to measure the personal experience of the progress that happened during the intervention as an alternative to assessing just the current level of the skills pre- and post-intervention.

The effects of mindfulness-based interventions and ACT have received a lot of interest, but in order to further increase our knowledge about the mechanisms on how the changes in mindfulness and well-being occur during these interventions, more research is needed to find out about the mediating effects of learning an intervention's particular elements. Such future research could also shed light on the current debate on mindfulness as a concept and how it should be assessed.

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**APPENDIX**

**Appendix 1: The Learning Questionnaire items - English translation**

*Evaluate the following statements in relation to your situation before the Muupu-program:*

*1 = Not at all, 2 = Very little, 3 =To some extent, 4 = Quite well, 5 = Really well*

**MA Self**

1. I have learned to become aware of my own thoughts, feelings and bodily reactions.

2. I have learned to identify my way of acting, especially my efforts to avoid or pursue something.

3. I have learned to accept my own thoughts, feelings and bodily reactions.

4. I have learned to let go of my mind's self-harming patterns.

5. I have learned to apply MF-skills into my everyday life.

6. I have learned to become free of my persistent habits.

**MAV Work**

13. I have learned to clarify my view of my own working conditions.

14. I have learned to clarify if values that are important for me are fulfilled within my job.

15. I have learned to determine what I can do myself to promote my (work) well-being.

16. I have learned to clarify in what way my work conditions could be improved so that they would support my work well-being and prevent burnout.

**Values**

8. I have learned to clarify my own values.

9. I have learned to plan actions that are consistent with my values.

10. I have learned to carry out actions that are consistent with my values.

**Excluded items**

7. I have learned to reshape my normal ways of acting in life.

11. I have learned to identify resources and things that bring me happiness in my life.

12. I have learned to identify sources of gratitude in my life.

**Appendix 2: The Learning Questionnaire items - Original Finnish version**

*Arvioi seuraavia väittämiä suhteessa tilanteeseen ennen Muupu-harjoitusohjelmaa:*

*1 = En lainkaan, 2 = Hyvin vähän, 3 = Jonkin verran, 4 = Melko hyvin, 5 = Erittäin hyvin*

**MA Self**

1. Olen oppinut tiedostamaan ajatuksiani, tunteitani ja kehollisia reaktioitani.

2. Olen oppinut tunnistamaan toimintatapojani, erityisesti välttämis- ja tavoittelemispyrkimyksiäni.

3. Olen oppinut hyväksymään ajatuksiani, tunteitani ja kehollisia reaktioitani.

4. Olen oppinut päästämään irti itseäni vahingoittavista mielen malleista.

5. Olen oppinut MF-taitojen soveltamista arkeen.

6. Olen oppinut vapautumaan pinttyneistä tavoistani.

**MAV Work**

13. Olen oppinut selkeyttämään näkemystäni omista työolosuhteistani.

14. Olen oppinut selkeyttämään sitä, toteutuvatko työssäni minulle tärkeät arvot.

15. Olen oppinut määrittämään, mitä voin itse tehdä edistääkseni (työ)hyvinvointiani.

16. Olen oppinut selkeyttämään, millä tavalla työolosuhteitani voitaisiin kehittää niin, että ne tukisivat työhyvinvointiani ja ehkäisisivät työuupumusta.

**Values**

8. Olen oppinut selkeyttämään omia arvojani.

9. Olen oppinut suunnittelemaan arvojeni mukaisia toimia.

10. Olen oppinut toteuttamaan arvojeni mukaisia toimia.

**Excluded items**

7. Olen oppinut uudistamaan tavanomaisia elämässä toimimisen mallejani.

11. Olen oppinut tunnistamaan voimavaroja ja iloa tuovia asioita elämässäni.

12. Olen oppinut tunnistamaan kiitollisuuden lähteitä elämässäni.

## Appendix 3: Exploratory Factor Analysis

The 16 item Learning Questionnaire was divided into three factors with exploratory factor analysis (EFA) using principal axis factoring and promax for rotation. The first EFA presented a three factor model with eigenvalues greater than 1, explaining 62.6% of total variance. The amount of factors was tested by recomputing the analysis with two and four factor models, and comparing total variances explained, communalities and item loading structure from a theoretical point of view. After that, it was concluded that a three factor model was the best fit.

Three items were excluded from the final model by evaluating the difference between their highest and second highest factor loading. The analysis was recomputed after every exclusion and the new values used as criterion for the next exclusion. Each time the item with the smallest difference between factor loadings was excluded. Item number 7 was excluded with a difference of .050, item 11 with a difference of .237 and item 12 with a difference of .169. The difference for item number 12 decreased after excluding item number 11 from the model, making it clear that it was to be excluded also. For a comparison, the smallest difference between factor loadings for an item included into the final model was .353 (item number 6 in Table A.) This final three factor model with 13 items accounted for 63.3% of total variance. The structure, loadings and communalities can be seen in Table A.

Correlations between the LQ, LQ-S and the factors were also computed (Table B). Not surprisingly the correlations between LQ and LQ-S were high as well as their correlations with the factors. More importantly the factors correlated significantly between themselves which concludes that promax was a suitable rotation method. Correlation between the factors was to be expected as they all measure the learning of the intervention's elements.

Table A. Factor Loadings and Communalities for the Learning Questionnaire

| Items | F1 MA Self | F2 MAV Work | F3 Values | h2 |
|---|---|---|---|---|
| 1. I have learned to become aware of my own thoughts, feelings and bodily reactions. | **.833** | .034 | -.033 | .697 |
| 2. I have learned to identify my way of acting, especially my efforts to avoid or pursue something. | **.785** | -.088 | .041 | .574 |
| 3. I have learned to accept my own thoughts, feelings and bodily reactions. | **.723** | -.021 | .041 | .541 |
| 4. I have learned to let go of my mind's self-harming patterns. | **.605** | .239 | -.145 | .473 |
| 5. I have learned to apply MF-skills into my everyday life. | **.665** | .042 | .057 | .533 |
| 6. I have learned to become free of my persistent habits. | **.511** | -.073 | .158 | .330 |
| 8. I have learned to clarify my own values. | -.017 | .102 | **.816** | .764 |
| 9. I have learned to plan actions that are consistent with my values. | .014 | -.045 | **.981** | .926 |
| 10. I have learned to carry out actions that are consistent with my values. | .077 | .025 | **.814** | .775 |
| 13. I have learned to clarify my view of my own work conditions. | .045 | **.774** | .047 | .698 |
| 14. I have learned to clarify if values that are important for me are fulfilled within my job. | .016 | **.712** | .178 | .720 |
| 15. I have learned to determine what I can do myself to promote my (work) well-being. | -.075 | **.849** | -.006 | .639 |

Table B. Intercorrelation Matrix between the full LQ, the short LQ and the LQ subscales

| Factor | LQ | LQ-S | F1 Mf Self | F2 Mf Work | F3 Values |
|---|---|---|---|---|---|
| LQ | - - | | | | |
| LQ-S | .992** | - - | | | |
| MA Self | .863** | .879** | - - | | |
| MAV Work | .848** | .854** | .589** | - - | |
| Values | .845** | .840** | .601** | .634** | - - |

Note. LQ = Learning Questionnaire; LQ-S = non-factor items excluded