Mindfulness Training at Aimia: Research Study Report

Jutta Tobias, 21 January 2016

Executive Summary

While the popular media is full of reports on the purported benefits of mindfulness for organisations, rigorous empirical evidence of the actual effect of mindfulness training programmes in organisations is much more scarce.

In this context, and drawing on prior research examining the link between mindfulness training and well-being as well as cognitive skills (Brown et al, 2007; Malinowski & Lim, 2015; Zeidan et al., 2010; Jha et al, 2010; Leonard et al., 2013; Mrazek et al., 2013), Aimia have partnered with Cranfield University to test to what extent a six week course in mindfulness training provided by Mindfulness at Work Ltd may generate beneficial change for their employees. The course was delivered face to face at Aimia's London offices as well as online.

In particular, the present research study set out to evaluate to what extent the mindfulness training course provided at Aimia may be linked to changes in participants' resilience, emotional intelligence, and self-control, as well as any change in their working memory, a reliable predictor of high achievement (Ruthsatz & Urbach, 2012). Resilience, self-control and emotional intelligence were assessed using self-report scales, while working memory was assessed using an objective computer test (Unsworth et al., 2005).

Out of 265 participants in the mindfulness training programme, 93 participants completed 2 of the 3 evaluation points for the research study. Statistical analyses revealed that participants randomly assigned to the first mindfulness training "wave" (group) showed significant increases in resilience, compared to the (waitlist) control group. Interestingly, this effect occurred for both face to face and online delivery methods of the mindfulness training.

This is a noteworthy and highly beneficial finding, because it allows us to conclude that this positive change was due to the mindfulness training, as this was the only meaningful difference between the (randomly assigned) participating groups.

This finding also constitutes a meaningful and worthwhile contribution beyond the scope of this project at Aimia and the world of management practice, because despite much public interest in mindfulness in general and in mindfulness interventions in workplaces in particular, virtually no prior empirical research exists in the peer-reviewed literature that has demonstrated such a link, let alone research following a randomised controlled trial (RCT) research design: most prior research linking mindfulness with resilience is either based on theory (Teasdale et al., 1995) or on correlational, cross-sectional field studies (c.f. Roche et al., 2014), and only one related research study could be identified that has also demonstrated a raise in resilience following a workplace mindfulness intervention, in an Intensive Care Unit in a hospital setting (Klatt et al., 2015).

None of the other examined variables showed any statistically significant changes over the duration of the research study.

Contents

Research design

The study followed a 2x2 factor between-subjects randomised controlled trial (RCT) experiment, resulting in 4 cells/groups:

1. Face-to-face vs. online training
2. Intervention vs. waitlist control group (aka "Wave 1" vs. "Wave 2" below)

265 individuals signed up to participate in the study.

The intervention consisted of a six-week mindfulness training course based on MBSR designed and delivered by Mindfulness at Work.

Participants agreed to be examined at three test times (more detail on this in the Research procedure section below).

Measures

The following instruments and measures were used (for all three test times):

1. Cranfield Qualtrics online survey, measuring
    a. Demographics (office location; age; experience with practicing mindfulness; gender)
    b. Brief Resilient Coping Scale (Sinclair & Wallston, 2004)
    c. Brief Self Control Scale (Tangney et al., 2004)
    d. BEIS-10 – Brief Emotional Intelligence Scale (Davies et al., 2010)
2. Auto OSPAN – an online test assessing participants' working memory (Unsworth et al., 2005)

Sampling

Participation was voluntary. All participation volunteers were randomly assigned to any of the 4 condition cells/groups.

Informed consent was assessed via the first Qualtrics online survey. If the participant declined to participate in the study, the survey ended and they were simply invited to continue with the training but without being invited for further tests.

Research procedure

There were 3 test cycles and 2 mindfulness training "waves", with participants randomly assigned to condition. This means the following:

- Half of all participants received the intervention first, the other half received the intervention once the first group had completed the mindfulness training, *and*
- Half of all participants received the intervention face-to-face, while the other half received the training using an online channel, *and*
- *All* participants were measured 3 times, i.e.
    - *Before* the start of "Wave 1"
    - *Between* "Wave 1" and "Wave 2"
    - *After* completion of "Wave 2"

Participation in the test cycles was independent of mindfulness training participation, and the identity of individuals was only to be known by Cranfield to ensure ethical use of the research data.

Research schedule

The RCT ran between 20/4/2015 and 31/7/2015.

Findings

93 participants completed at least 2 consecutive test sets and attended at least 4 mindfulness training sessions at Aimia (either online or face to face at Aimia's 80 Strand location in London).

The low participation numbers in the test cycles was surprising to the mindfulness team, despite the fact that each of the three test cycles took up to 30 minutes to complete. However, this is probably due to the fact that this was not mandatory and training course participants were busy at work, despite communicating extensively with participants ahead of the training programme and throughout about the rationale and process of the research component of this programme. This is also despite consistent attempts to ease participation in the research component of the mindfulness programme by booking separate rooms in various locations to make it easy for participants to complete the test cycles (see Appendix C for more information).

Between-group comparisons

Because most participants did not complete the third test cycle, the analyses below are based on comparing participants' data between the first and second test cycle. In other words, the statistical tests are focused on comparing "Wave 1" participants' outcomes before and after completing their mindfulness training to "Wave 2" participants who served as control group for this statistical comparison.

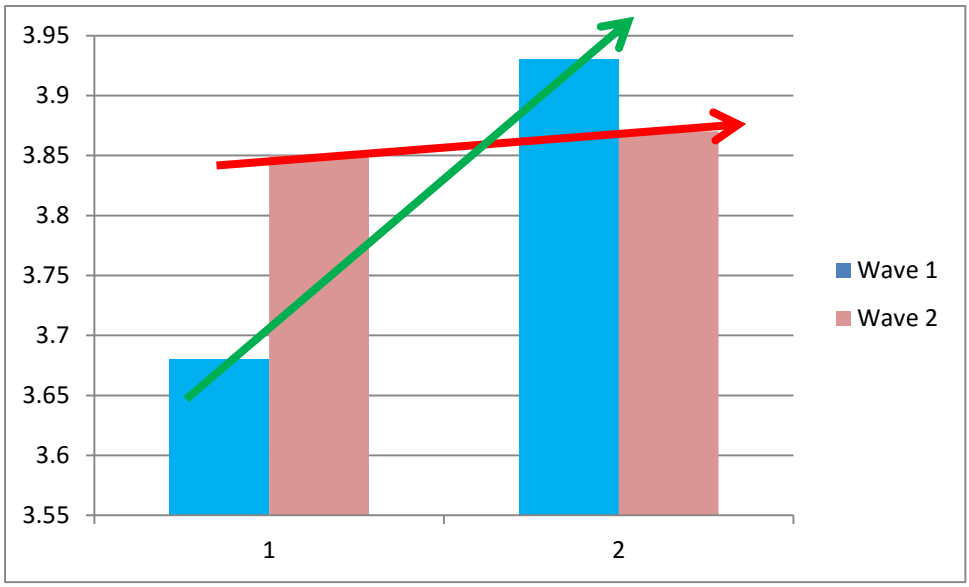
Resilience

Statistical analyses using Repeated Measures Mixed ANOVA demonstrated that there was a statistically significant effect of time on participants' resilience, $F(1, 10) = 5.73$, $p = .019$.

In other words, those individuals who had completed the six hours of mindfulness training sessions showed significantly higher resilience compared to those in "Wave 2", serving as the (waitlist) control group for "Wave 1" participants.

Diagram 1: Significant interaction between wave 1 and wave 2 of pilot intervention.

In the diagram below, the significant increase for "Wave 1" participants, as well as the interaction effect between group assignment to "Wave 1" participants vs "Wave 2" (the "waitlist control group") is shown graphically.



In plain English, this means that all participants in Wave 1 reported a significant increase in Resilience after they had received their training, whereas the Wave 2 participants answered the Resilience questions twice in very similar ways. This is because at both test points, Wave 2 participants had not done any mindfulness – as we had hypothesised and expected, their scores remained relatively constant while the scores for the "Wave 1" participants increased significantly and visibly.

Interestingly, no significant changes could be detected between the face to face delivery mode and the online delivery channel of the training. This means that delivering the mindfulness training online was as effective in raising participants' resilience as were the face to face sessions.

Other variables: Emotional Intelligence, Self Control, and Working Memory

Contrary to our expectations and hypotheses, none of the other variables under study showed any significant changes in either direction. In other words, we could not detect any statistically significant changes among any of these variables.

We also controlled for age and gender of participants yet could not find any significant effect of these variables either (none of the other demographic variables were usable for analyses).

The descriptive statistics for these variables is included in Appendix A.

Conclusions

Mindfulness training increasing resilience

The most significant finding of this research study is the statistically significant increase in resilience among participants in "Wave 1". This is both noteworthy and positive. This is because participants were randomly assigned to either "Wave 1" or "Wave 2", and the group allocation constituted the only meaningful group difference. It can therefore be concluded that the mindfulness training was the cause of the beneficial increase for training participants.

As our study demonstrates, mindfulness training may indeed be a causal factor in helping raise resilience among employees operating in demanding work contexts.

This finding makes a worthwhile contribution both to the world of management practice as well as scientific theory, as most prior research linking mindfulness with resilience is either based on theory (Teasdale et al., 1995) or on correlational, cross-sectional field studies (c.f. Roche et al., 2014).

Lack of significance among other test variables

However, contrary to our expectations, none of the other test variables demonstrated any statistically significant change, nor did it make any difference if participants received the mindfulness training face to face or via the online delivery channel.

This is not altogether surprising as very few field research studies exist that have empirically examined specific wellbeing and performance-related variables as part of a mindfulness intervention. In particular, to the best of our knowledge no published empirical studies exist that have verified empirically the theoretical link between mindfulness training and emotional intelligence and self-control. It is possible that the dosage of the 6 session mindfulness training was simply too low to generate such an effect after 6 one-hour weekly sessions. It may well be that the resilience-boosting effect we observed in our study is the most prominent among the three wellbeing-related factors we examined, hence it proved quicker to surface. More research is needed to examine this finding further.

As for testing the participants' working memory, there is prior published field research in a military setting that indicates that mindfulness training may indeed be a causal factor in raising service members' cognitive skills as measured using their working memory capacity (Jha et al, 2010). In addition, the present research study followed the design of an earlier (unpublished) study conducted at Cranfield University in 2014 that demonstrated a causal link between mindfulness training and increases in working memory. However, it is possible that a university setting constitutes an environment where less environmental (and hence statistically significant) 'noise' may dampen down any beneficial change as a result of participating in mindfulness training.

In conclusion, empirical field research following rigorous experimental designs such as the present study on mindfulness interventions in organisations is extremely rare. The present study therefore makes a helpful and newsworthy contribution to both theory and management practice.
More research is needed to explore the findings of this study further. As a researcher, it would be my delight to contribute to this important and meaningful endeavour.

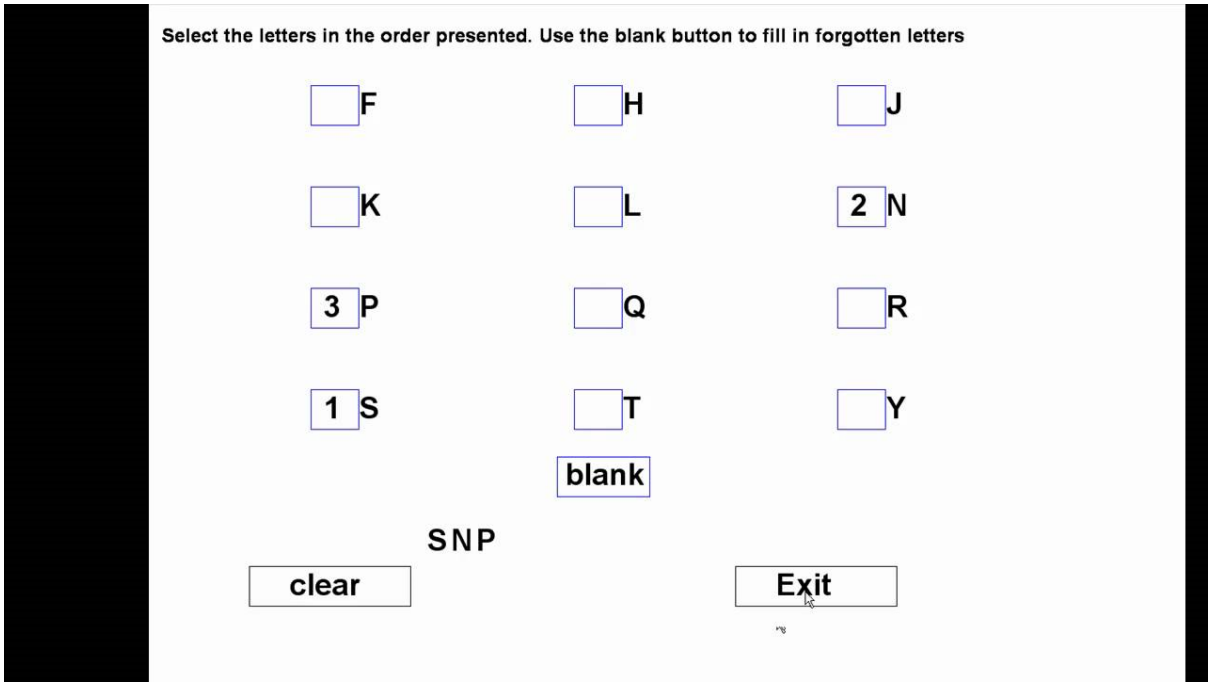
Jutta Tobias, 21 January 2016

Appendix A: Measurement instruments

Working Memory

For this measure, we used the Automated OSPAN (Unsworth et al., 2005) objective computer test commissioned by Millisecond Software. This test is accessible via an internet browser and takes the participant through a series of math calculations, interspersed with a variety of letter sequences that the participant has to remember (i.e. hold in their working memory). The participant is tested for a period of about 20 minutes, and at the end obtains a working memory score, which served as basis for this measurement.

Below is a screenshot of this measure:



Resilience

Brief Resilient Coping Scale (Sinclair & Wallston, 2004), 4 items, 5 point scale (1=not at all; 5=very true)

☐ I look for creative ways to alter difficult situations.

☐ Regardless of what happens to me, I believe I can control my reaction to it.

☐ I believe I can grow in positive ways by dealing with difficult situations.

☐ I actively look for ways to replace the losses I encounter in life.

Self Control

Self Control Scale (Tangney et al, 2004), 13 items, 5 point scale (1=not at all; 5=very true), items 2, 3, 4, 5, 7, 9, 10, 12, and 13 need to be reverse-coded (RC)

☐ I am good at resisting temptation.

☐ I have a hard time breaking bad habits.

☐ I am lazy.

☐ I say inappropriate things.

☐ I do certain things that are bad for me, if they are fun.

☐ I refuse things that are bad for me.

☐ I wish I had more self-discipline.

☐ People would say that I have iron self-discipline.

☐ Pleasure and fun sometimes keep me from getting work done.

☐ I have trouble concentrating.

☐ I am able to work effectively towards long-term goals.

☐ Sometimes I can't stop myself from doing something, even if I know it is wrong.

☐ I often act without thinking through all the alternatives.

Emotional Intelligence

Emotional Intelligence (BEIS-10; Davies et al 2010); 10 items; 5 point scale (1=disagree; 5=agree)

☐ I know why my emotions change.

☐ I easily recognise my emotions as I experience them.

☐ I can tell how people are feeling by listening to the tone of their voice.

☐ By looking at their facial expressions, I recognise the emotions people are experiencing.

☐ I seek out activities that make me happy.

☐ I have control over my emotions.

☐ I arrange events others enjoy.

☐ I help other people feel better when they are down.

☐ When I am in a positive mood, I am able to come up with new ideas.

☐ I use good moods to help myself keep trying in the face of obstacles.

Appendix B: Descriptive Statistics

Working memory

Report

Mode	Wave		WorkingMemory 1	WorkingMemory 2	WorkingMemory 3
80 Strand	Wave 1	Mean	43.39	45.18	41.74
		N	28	28	19
		Std. Deviation	16.789	18.387	18.938
	Wave 2	Mean	50.36	49.14	52.73
		N	28	28	11
		Std. Deviation	20.429	18.155	17.721
	Total	Mean	46.87	47.16	45.77
		N	56	56	30
		Std. Deviation	18.857	18.215	18.971
Online	Wave 1	Mean	44.47	49.11	55.29
		N	19	19	14
		Std. Deviation	19.118	20.393	19.093
	Wave 2	Mean	48.24	52.47	64.00
		N	17	17	7
		Std. Deviation	15.356	13.852	12.806
	Total	Mean	46.25	50.69	58.19
		N	36	36	21
		Std. Deviation	17.303	17.450	17.432
Total	Wave 1	Mean	43.83	46.77	47.48
		N	47	47	33
		Std. Deviation	17.571	19.104	19.902
	Wave 2	Mean	49.56	50.40	57.11
		N	45	45	18
		Std. Deviation	18.518	16.574	16.570
	Total	Mean	46.63	48.54	50.88
		N	92	92	51
		Std. Deviation	18.171	17.907	19.194

Self Control

Report

Mode	Wave		SC_T1	SC_T2	SC_T3
80 Strand	Wave1	Mean	3.0028	3.1538	3.1077
		N	27	24	20
		Std. Deviation	.59755	.55748	.55098
	Wave2	Mean	2.8709	3.0032	3.0625
		N	28	24	16
		Std. Deviation	.50639	.53220	.49790
	Total	Mean	2.9357	3.0785	3.0876
		N	55	48	36
		Std. Deviation	.55188	.54450	.52112
Online	Wave1	Mean	3.0688	3.2596	3.2260
		N	19	16	16
		Std. Deviation	.61050	.61850	.67322
	Wave2	Mean	3.0171	2.9904	3.2308
		N	18	16	11
		Std. Deviation	.65726	.56588	.53183
	Total	Mean	3.0437	3.1250	3.2279
		N	37	32	27
		Std. Deviation	.62533	.59896	.60850
Total	Wave1	Mean	3.0301	3.1962	3.1603
		N	46	40	36
		Std. Deviation	.59705	.57721	.60216
	Wave2	Mean	2.9281	2.9981	3.1311
		N	46	40	27
		Std. Deviation	.56768	.53874	.50883
	Total	Mean	2.9791	3.0971	3.1477
		N	92	80	63
		Std. Deviation	.58161	.56364	.55989

Emotional Intelligence

Report

Mode	Wave		EI_T1	EI_T2	EI_T3
80 Strand	Wave1	Mean	3.7037	3.9125	3.9250
		N	27	24	20
		Std. Deviation	.44418	.36986	.36689
	Wave2	Mean	3.7143	3.8417	3.9063
		N	28	24	16
		Std. Deviation	.47353	.42622	.40078
	Total	Mean	3.7091	3.8771	3.9167
		N	55	48	36
		Std. Deviation	.45512	.39639	.37683
Online	Wave1	Mean	3.7316	3.7625	3.8250
		N	19	16	16
		Std. Deviation	.51753	.35940	.39581
	Wave2	Mean	3.8222	3.8750	3.8455
		N	18	16	11
		Std. Deviation	.38738	.37148	.69045
	Total	Mean	3.7757	3.8188	3.8333
		N	37	32	27
		Std. Deviation	.45485	.36406	.52330
Total	Wave1	Mean	3.7152	3.8525	3.8806
		N	46	40	36
		Std. Deviation	.47045	.36863	.37783
	Wave2	Mean	3.7565	3.8550	3.8815
		N	46	40	27
		Std. Deviation	.44053	.40061	.52626
	Total	Mean	3.7359	3.8538	3.8810
		N	92	80	63
		Std. Deviation	.45370	.38251	.44354

Appendix C: Sample communications with research participants

Communique from Aimia about participation in first test cycle

AIMIA

MINDFULNESS

Deadline - TODAY to complete online tasks Time 1 of 3

You will have received an email from Jutta Tobias with the title:

"MINDFULNESS: Research with Cranfield - Your unique participant code and testing phases"

You will need this email and the enclosed code to complete the two tasks below.

Your first two-fold task:

1. The link below will enable you to record your consent to participate in the research study and subsequently complete a short survey (requires about 10-15 minutes)

https://cranfielduniversity.eu.qualtrics.com/SE/?SID=SV_2mbQeN01b4lPTZX

2. The link below will take you to an online task. Please follow the instructions on the screen; you may be asked to install the "Inquisit Web Player" which you can uninstall afterwards (requires about 20-30 minutes).

http://research.millisecond.com/juttatobias/AutomatedOSPAN.web

As we are looking at ‘the way we think’ in these tasks, we advise that you book a meeting room for an hour to **ensure that you are in a quiet environment free from distractions.**

If you are based in the London Office, we have booked RACECAR at 13.00-14.00 and 14.00-15.00 on the 1st of May, you are welcome to pop in, **on the hour**, to complete your tasks and ask any questions you may have.

Thank you for your participation, it is greatly appreciated!

The L&D team

If you have not received an email from Jutta or have any questions about the study. Please email her on jutta.tobias@cranfield.ac.uk

Please note that you are not required to complete these online tasks in order to participate in the mindfulness training – this is voluntary. If you decline this invitation, you can still go ahead in the mindfulness training as planned.

Communique from Cranfield about participating in first test cycle

[subject line in email] MINDFULNESS: Research with Cranfield - Your unique participant code and testing phases

AIMIA

MINDFULNESS

Cranfield UNIVERSITY

Your unique participant code and testing phases

Hi [Name]

Welcome onboard the Mindfulness Training!

As you know, this mindfulness training programme is organised as a research study with Cranfield University, looking into 'the way we think'. I am really looking forward to working with you on this first-of-its-kind research!

In order to take part in this research study, there are a few bits of information you need to know:

- We have randomly assigned everyone who signed up to take part into one of four groups. You have been assigned to:

  [Group allocation]

- We are giving everyone a unique code to take part in this study. This means we can anonymise your data and can track it over the study period**.**

  ## Your unique code is: [Participant Code]

- Independent of the group you are in, we are asking you to complete the following two online tasks, and at three times in total:

  1. **Between today, 20 April, and 1st May**
  2. **Between 1st June and 12th June**
  3. **Between 6th July and 30th July**

It is important that the tasks are completed within these time periods, therefore we will be sending diary invites and reminders as prompts.

If you take part in the study (completing the three tasks within the time slots) and would like a personalised report of your data, please email me at jutta.tobias@cranfield.ac.uk

Your first two-fold task:

a) The link below will enable you to record your consent to participate in the research study and subsequently complete a short survey (requires about 10-15 minutes) https://cranfielduniversity.eu.qualtrics.com/SE/?SID=SV_2mbQeN01b4lPTZX

b) The link below will take you to an online task. Please follow the instructions on the screen; you may be asked to install the "Inquisit Web Player" which you can uninstall afterwards (requires about 20-30 minutes). http://research.millisecond.com/juttatobias/AutomatedOSPAN.web

Please note that you are not required to complete these online tasks in order to participate in the mindfulness training – this is voluntary. If you decline this invitation, you can still go ahead in the mindfulness training as planned.

For any questions about this, please contact me directly by return via email.

I very much look forward to working with you on this.

All the best

Jutta Tobias

Appendix D: References

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