

# **36 mindfulness & compassion relevant abstracts: february '16 newsletter**

(Bilderbeck, Brazil et al. 2015; Coulton, Clift et al. 2015; Dahm, Meyer et al. 2015; Duarte, McEwan et al. 2015; Ford, Dmitrieva et al. 2015; Galla and Duckworth 2015; Gothe and McAuley 2015; Grove, Baillie et al. 2015; Huijbers, Spinhoven et al. 2015; Kelly and Carter 2015; Kim, Boldt et al. 2015; King, Jackson et al. 2015; Kurzban, Burton-Chellew et al. 2015; Lau, Cheung et al. 2015; Masland and Hooley 2015; Michalak, Schultze et al. 2015; Mikolajczak, Avalosse et al. 2015; Peters and Kashima 2015; Pinto, Verissimo et al. 2015; Proctor, Tweed et al. 2015; Puntsher, Hauser et al. 2015; Raposa, Laws et al. 2015; Reimer and Moscovitch 2015; Robinson, Hoplock et al. 2015; Sani, Madhok et al. 2015; Shallcross, Gross et al. 2015; Smallwood and Schooler 2015; Tamir, Schwartz et al. 2015; Vachon, Krueger et al. 2015; Wilson, Mickes et al. 2015; Zeidan, Emerson et al. 2015; Huang 2016; Lim and DeSteno 2016; Mansson, Salami et al. 2016; Richards 2016; Veehofab, Trompetera et al. 2016)

Bilderbeck, A. C., I. A. Brazil, et al. (2015). **"Preliminary evidence that yoga practice progressively improves mood and decreases stress in a sample of uk prisoners."** *Evid Based Complement Alternat Med* 2015: 819183.  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4534616/>

(Free full text available) Objectives. In the first randomized controlled trial of yoga on UK prisoners, we previously showed that yoga practice was associated with improved mental wellbeing and cognition. Here, we aimed to assess how class attendance, self-practice, and demographic factors were related to outcome amongst prisoners enrolled in the 10-week yoga intervention. Methods. The data of 55 participants (52 male, 3 female) who completed a 10-week yoga course were analysed. Changes in pre- and postyoga measures of affect, perceived stress, and psychological symptoms were entered into linear regression analyses with bias-corrected and accelerated bootstrap confidence intervals. Class attendance, self-practice, demographic variables, and baseline psychometric variables were included as regressors. Results. Participants who attended more yoga classes and those who engaged in frequent (5 times or more) self-practice reported significantly greater decreases in perceived stress. Decreases in negative affect were also significantly related to high frequency self-practice and greater class attendance at a near-significant level. Age was positively correlated with yoga class attendance, and higher levels of education were associated with greater decreases in negative affect. Conclusions. Our results suggest that there may be progressive beneficial effects of yoga within prison populations and point to subpopulations who may benefit the most from this practice.

Coulton, S., S. Clift, et al. (2015). **"Effectiveness and cost-effectiveness of community singing on mental health-related quality of life of older people: Randomised controlled trial."** *The British Journal of Psychiatry* 207(3): 250-255.  
<http://bjprcpsych.org/bjprcpsych/207/3/250.full.pdf>

Background As the population ages, older people account for a greater proportion of the health and social care budget. Whereas some research has been conducted on the use of music therapy for specific clinical populations, little rigorous research has been conducted looking at the value of community singing on the mental health-related quality of life of older people. Aims To evaluate the effectiveness and cost-effectiveness of community group singing for a population of older people in England. Method A pilot pragmatic individual randomised controlled trial comparing group singing with usual activities in those aged 60 years or more. Results A total of 258 participants were recruited across five centres in East Kent. At 6 months post-randomisation, significant differences were observed in terms of mental health-related quality of life measured using the SF12 (mean difference = 2.35; 95% CI = 0.06-4.76) in favour of group singing. In addition, the intervention was found to be marginally more cost-effective than usual activities. At 3 months, significant differences were observed for the mental health components of quality of life (mean difference = 4.77; 2.53-7.01), anxiety (mean difference = -1.78; -2.5 to -1.06) and depression (mean difference = -1.52; -2.13 to -0.92). Conclusions Community group singing appears to have a significant effect on mental health-related quality of life, anxiety and depression, and it may be a useful intervention to maintain and enhance the mental health of older people.

Dahm, K. A., E. C. Meyer, et al. (2015). **"Mindfulness, self-compassion, posttraumatic stress disorder symptoms, and functional disability in U.S. Iraq and afghanistan war veterans."** *Journal of Traumatic Stress* 28(5): 460-464.  
<http://dx.doi.org/10.1002/jts.22045>

Mindfulness and self-compassion are overlapping, but distinct constructs that characterize how people relate to emotional distress. Both are associated with posttraumatic stress disorder (PTSD) and may be related to functional disability. Although self-compassion includes mindful awareness of emotional distress, it is a broader construct that also includes being kind and supportive to oneself and viewing suffering as part of the shared human experience—a potentially powerful way of dealing with distressing situations. We examined the association of mindfulness and self-compassion with PTSD symptom severity and functional disability in 115 trauma-exposed U.S. Iraq/Afghanistan war veterans. Mindfulness and self-compassion were each uniquely, negatively associated with PTSD symptom severity. After accounting for mindfulness, self-compassion accounted for unique variance in PTSD symptom severity ( $f^2 = .25$ ; medium ES). After accounting for PTSD symptom severity, mindfulness and self-compassion were each uniquely negatively associated with functional disability. The combined association of mindfulness and self-compassion with disability over and above PTSD was large ( $f^2 = .41$ ). After accounting for mindfulness, self-compassion accounted for unique variance in disability ( $f^2 = .13$ ; small ES). These findings suggest that interventions aimed at increasing mindfulness and self-compassion could potentially decrease functional disability in returning veterans with PTSD symptoms.

Duarte, J., K. McEwan, et al. (2015). **"Do therapeutic imagery practices affect physiological and emotional indicators of threat in high self-critics?"** *Psychology and Psychotherapy: Theory, Research and Practice* 88(3): 270-284.  
<http://dx.doi.org/10.1111/papt.12043>

Objectives Imagery is known to be a powerful means of stimulating various physiological processes and is increasingly used within standard psychological therapies. Compassion-focused imagery (CFI) has been used to stimulate affiliative emotion in people with mental health problems. However, evidence suggests that self-critical individuals may have particular difficulties in this domain with single trials. The aim of the present study was to further investigate the role of self-criticism in responsiveness to CFI by specifically pre-selecting participants based on trait self-criticism. Design Using the Forms of Self-Criticism/Self-Reassuring Scale, 29 individuals from a total sample of 139 were pre-selected to determine how self-criticism impacts upon an initial instance of imagery. Methods All participants took part in three activities: a control imagery intervention (useable data  $N = 25$ ), a standard CFI intervention (useable data  $N = 25$ ), and a non-intervention control (useable data  $N = 24$ ). Physiological measurements (alpha amylase) as well as questionnaire measures of emotional responding (i.e., the Positive and Negative Affect Schedule, the Types of Positive Affect Scale, and the State Adult Attachment Scale) were taken before and after the different interventions. Results Following both imagery interventions, repeated measures analyses revealed

that alpha amylase increased significantly for high self-critics compared with low self-critics. High self-critics (HSC) also reported greater insecurity on entering the imagery session and more negative CFI experiences compared with low self-critics. Conclusions Data demonstrates that HSC respond negatively to imagery interventions in a single trial. This highlights that imagery focused therapies (e.g., CFI) need interventions that manage fears, blocks, and resistances to the techniques, particularly in HSC. Practitioner points \* An initial instance of imagery (e.g., CFI) can be frightening for people who have a tendency to be self-critical. \* This research provides examples of physiological and emotional responses to imagery type therapies in high and low self-critics, and associated clinical implications. \* Therapists may find it helpful to be mindful that when introducing imagery based therapies, highly self-critical patients need interventions that manage fears, blocks, and resistances to the techniques.

Ford, B. Q., J. O. Dmitrieva, et al. (2015). **"Culture shapes whether the pursuit of happiness predicts higher or lower well-being."** *J Exp Psychol Gen.* <http://www.ncbi.nlm.nih.gov/pubmed/26347945>

Pursuing happiness can paradoxically impair well-being. Here, the authors propose the potential downsides to pursuing happiness may be specific to individualistic cultures. In collectivistic (vs. individualistic) cultures, pursuing happiness may be more successful because happiness is viewed-and thus pursued-in relatively socially engaged ways. In 4 geographical regions that vary in level of collectivism (United States, Germany, Russia, East Asia), we assessed participants' well-being, motivation to pursue happiness, and to what extent they pursued happiness in socially engaged ways. Motivation to pursue happiness predicted lower well-being in the United States, did not predict well-being in Germany, and predicted higher well-being in Russia and in East Asia. These cultural differences in the link between motivation to pursue happiness and well-being were explained by cultural differences in the socially engaged pursuit of happiness. These findings suggest that culture shapes whether the pursuit of happiness is linked with better or worse well-being, perhaps via how people pursue happiness. (PsycINFO Database Record

Galla, B. M. and A. L. Duckworth (2015). **"More than resisting temptation: Beneficial habits mediate the relationship between self-control and positive life outcomes."** *J Pers Soc Psychol* 109(3): 508-525. <http://www.ncbi.nlm.nih.gov/pubmed/25643222>

Why does self-control predict such a wide array of positive life outcomes? Conventional wisdom holds that self-control is used to effortfully inhibit maladaptive impulses, yet this view conflicts with emerging evidence that self-control is associated with less inhibition in daily life. We propose that one of the reasons individuals with better self-control use less effortful inhibition, yet make better progress on their goals is that they rely on beneficial habits. Across 6 studies (total N = 2,274), we found support for this hypothesis. In Study 1, habits for eating healthy snacks, exercising, and getting consistent sleep mediated the effect of self-control on both increased automaticity and lower reported effortful inhibition in enacting those behaviors. In Studies 2 and 3, study habits mediated the effect of self-control on reduced motivational interference during a work-leisure conflict and on greater ability to study even under difficult circumstances. In Study 4, homework habits mediated the effect of self-control on classroom engagement and homework completion. Study 5 was a prospective longitudinal study of teenage youth who participated in a 5-day meditation retreat. Better self-control before the retreat predicted stronger meditation habits 3 months after the retreat, and habits mediated the effect of self-control on successfully accomplishing meditation practice goals. Finally, in Study 6, study habits mediated the effect of self-control on homework completion and 2 objectively measured long-term academic outcomes: grade point average and first-year college persistence. Collectively, these results suggest that beneficial habits-perhaps more so than effortful inhibition-are an important factor linking self-control with positive life outcomes.

Gothe, N. P. and E. McAuley (2015). **"Yoga and cognition: A meta-analysis of chronic and acute effects."** *Psychosomatic Medicine* 77(7): 784-797. [http://journals.lww.com/psychosomaticmedicine/Fulltext/2015/09000/Yoga\\_and\\_Cognition\\_A\\_Meta\\_Analysis\\_of\\_Chronic.9.aspx](http://journals.lww.com/psychosomaticmedicine/Fulltext/2015/09000/Yoga_and_Cognition_A_Meta_Analysis_of_Chronic.9.aspx)

Objectives: To review and synthesize the existing literature on the effects of yoga on cognitive function by determining effect sizes that could serve as a platform to design, calculate statistical power, and implement future studies. Methods: Through electronic databases, we identified acute studies and randomized controlled trials (RCTs) of yoga that reported cognitive outcomes. Inclusion criteria included the following: use of an objective measure of cognition and sufficient data reported to estimate an effect size. The meta-analysis was conducted using Comprehensive Meta-Analysis software. A random-effects model was used to calculate the overall weighted effect sizes, expressed as Hedge g. Results: Fifteen RCTs and 7 acute exposure studies examined the effects of yoga on cognition. A moderate effect ( $g = 0.33$ , standard error = 0.08, 95% confidence interval = 0.18–0.48,  $p < .001$ ) of yoga on cognition was observed for RCTs, with the strongest effect for attention and processing speed ( $g = 0.29$ ,  $p < .001$ ), followed by executive function ( $g = 0.27$ ,  $p = .001$ ) and memory ( $g = 0.18$ ,  $p = .051$ ). Acute studies showed a stronger overall effect of yoga on cognition ( $g = 0.56$ , standard error = 0.11, 95% confidence interval = 0.33–0.78,  $p < .001$ ). The effect was strongest for memory ( $g = 0.78$ ,  $p < .001$ ), followed by attention and processing speed measures ( $g = 0.49$ ,  $p < .001$ ) and executive functions ( $g = 0.39$ ,  $p < .003$ ). Conclusions: Yoga practice seems to be associated with moderate improvements in cognitive function. Although the studies are limited by sample size, heterogeneous population characteristics, varied doses of yoga interventions, and a myriad of cognitive tests, these findings warrant rigorous systematic RCTs and well-designed counterbalanced acute studies to comprehensively explore yoga as a means to improve or sustain cognitive abilities across the life span.

Grove, R., A. Baillie, et al. (2015). **"Exploring the quantitative nature of empathy, systemising and autistic traits using factor mixture modelling."** *The British Journal of Psychiatry* 207(5): 400-406. <http://bjp.rcpsych.org/bjprcpsych/207/5/400.full.pdf>

Background: Autism research has previously focused on either identifying a latent dimension or searching for subgroups. Research assessing the concurrently categorical and dimensional nature of autism is needed. Aims To investigate the latent structure of autism and identify meaningful subgroups in a sample spanning the full spectrum of genetic vulnerability. Method Factor mixture models were applied to data on empathy, systemising and autistic traits from individuals on the autism spectrum, parents and general population controls. Results A two-factor three-class model was identified, with two factors measuring empathy and systemising. Class one had high systemising and low empathy scores and primarily consisted of individuals with autism. Mainly comprising controls and parents, class three displayed high empathy scores and lower systemising scores, and class two showed balanced scores on both measures of systemising and empathy. Conclusions Autism is best understood as a dimensional construct, but meaningful subgroups can be identified based on empathy, systemising and autistic traits.

Huang, Y. (2016). **"Downward social comparison increases life-satisfaction in the giving and volunteering context."** *Social Indicators Research* 125(2): 665-676

Using samples of U.S. residents recruited from an online subject pool, this research confirms that charitable behavior is associated with higher life-satisfaction based on a retrospective survey (Study 1). Adopting experimental manipulation, we also

find that participants report higher life-satisfaction after volunteering for a downward comparable target (i.e., the poor) than helping a non-comparable target (i.e., Wikipedia). But the above effect exists only among high social-comparison individuals (Study 2). Moreover, among people high in social comparison, comparing oneself with a downward comparable target without helping can lead to a similar level of life-satisfaction as helping the target. In contrast, participants who are low in social comparison achieve higher life-satisfaction when comparing themselves to rather than helping the target (Study 3). These findings suggest that charitable giving and volunteering contributes to life-satisfaction through allowing for downward social comparison.

Huijbers, M. J., P. Spinhoven, et al. (2015). **"Adding mindfulness-based cognitive therapy to maintenance antidepressant medication for prevention of relapse/recurrence in major depressive disorder: Randomised controlled trial."** *Journal of Affective Disorders* 187: 54-61. <http://www.sciencedirect.com/science/article/pii/S0165032715305231>

**Background** Mindfulness-based cognitive therapy (MBCT) and maintenance antidepressant medication (mADM) both reduce the risk of relapse in recurrent depression, but their combination has not been studied. Our aim was to investigate whether the addition of MBCT to mADM is a more effective prevention strategy than mADM alone. **Methods** This study is one of two multicenter randomised trials comparing the combination of MBCT and mADM to either intervention on its own. In the current trial, recurrently depressed patients in remission who had been using mADM for 6 months or longer (n=68), were randomly allocated to either MBCT+mADM (n=33) or mADM alone (n=35). Primary outcome was depressive relapse/recurrence within 15 months. Key secondary outcomes were time to relapse/recurrence and depression severity. Analyses were based on intention-to-treat. **Results** There were no significant differences between the groups on any of the outcome measures. **Limitations** The current study included patients who had recovered from depression with mADM and who preferred the certainty of continuing medication to the possibility of participating in MBCT. Lower expectations of mindfulness in the current trial, compared with the parallel trial, may have caused selection bias. In addition, recruitment was hampered by the increasing availability of MBCT in the Netherlands, and even about a quarter of participants included in the trial who were allocated to the control group chose to get MBCT elsewhere. **Conclusions** For this selection of recurrently depressed patients in remission and using mADM for 6 months or longer, MBCT did not further reduce their risk for relapse/recurrence or their (residual) depressive symptoms.

Kelly, A. C. and J. C. Carter (2015). **"Self-compassion training for binge eating disorder: A pilot randomized controlled trial."** *Psychology and Psychotherapy: Theory, Research and Practice* 88(3): 285-303. <http://dx.doi.org/10.1111/papt.12044>

**Objectives** The present pilot study sought to compare a compassion-focused therapy (CFT)-based self-help intervention for binge eating disorder (BED) to a behaviourally based intervention. **Design** Forty-one individuals with BED were randomly assigned to 3 weeks of food planning plus self-compassion exercises; food planning plus behavioural strategies; or a wait-list control condition. **Methods** Participants completed weekly measures of binge eating and self-compassion; pre- and post-intervention measures of eating disorder pathology and depressive symptoms; and a baseline measure assessing fear of self-compassion. **Results** Results showed that: (1) perceived credibility, expectancy, and compliance did not differ between the two interventions; (2) both interventions reduced weekly binge days more than the control condition; (3) the self-compassion intervention reduced global eating disorder pathology, eating concerns, and weight concerns more than the other conditions; (4) the self-compassion intervention increased self-compassion more than the other conditions; and (5) participants low in fear of self-compassion derived significantly more benefits from the self-compassion intervention than those high in fear of self-compassion. **Conclusions** Findings offer preliminary support for the usefulness of CFT-based interventions for BED sufferers. Results also suggest that for individuals to benefit from self-compassion training, assessing and lowering fear of self-compassion will be crucial. **Practitioner points** \* Individuals with BED perceive self-compassion training self-help interventions, derived from CFT, to be as credible and as likely to help as behaviourally based interventions. \* The cultivation of self-compassion may be an effective approach for reducing binge eating, and eating, and weight concerns in individuals with BED. \* Teaching individuals with BED CFT-based self-help exercises may increase their self-compassion levels over a short period of time. \* It may be important for clinicians to assess and target clients' fear of self-compassion for clients to benefit from self-compassion training interventions.

Kim, S., L. J. Boldt, et al. (2015). **"From parent-child mutuality to security to socialization outcomes: Developmental cascade toward positive adaptation in preadolescence."** *Attach Hum Dev* 17(5): 472-491. <http://www.ncbi.nlm.nih.gov/pubmed/26258443>

A developmental cascade from positive early parent-child relationship to child security with the parent to adaptive socialization outcomes, proposed in attachment theory and often implicitly accepted but rarely formally tested, was examined in 100 mothers, fathers, and children followed from toddler age to preadolescence. Parent-child Mutually Responsive Orientation (MRO) was observed in lengthy interactions at 38, 52, 67, and 80 months; children reported their security with parents at age eight. Socialization outcomes (parent- and child-reported cooperation with parental monitoring and teacher-reported school competence) were assessed at age 10. Mediation was tested with PROCESS. The parent-child history of MRO significantly predicted both mother-child and father-child security. For mother-child dyads, security mediated links between history of MRO and cooperation with maternal monitoring and school competence, controlling for developmental continuity of the studied constructs. For father-child dyads, the mediation effect was not evident.

King, H. R., J. J. Jackson, et al. (2015). **"Personality accounts for the connection between volunteering and health."** *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 70(5): 691-697. <http://psychocgerontology.oxfordjournals.org/content/70/5/691.abstract>

**Objectives.** Existing literature has shown that volunteering is related to better physical and mental health outcomes. The purpose of this study is to examine whether personality traits and volunteering are independent predictors of physical and mental health. **Methods.** The current study utilizes data from the St. Louis Personality and Aging Network (SPAN), a representative sample of community-based adults between the ages of 55 and 64. Using hierarchical linear regressions, we test whether volunteering is a significant predictor of both physical and mental health while controlling for personality traits. **Results.** We find that volunteering is not significantly related to either physical or mental health while controlling for personality traits. We also find that lower neuroticism is related to better physical functioning and mental health, whereas higher extraversion is related to better mental health. **Discussion.** These results indicate that volunteering may be related to health outcomes because of the personality characteristics of volunteers, not the volunteering experience in and of itself. Future longitudinal studies are needed to further explore the relationship between personality, volunteering, and health.

Kurzban, R., M. N. Burton-Chellew, et al. (2015). **"The evolution of altruism in humans."** *Annual Review of Psychology* 66(1): 575-599. <http://www.annualreviews.org/doi/abs/10.1146/annurev-psych-010814-015355>

Humans are an intensely social species, frequently performing costly behaviors that benefit others. Efforts to solve the evolutionary puzzle of altruism have a lengthy history, and recent years have seen many important advances across a range of disciplines. Here we bring together this interdisciplinary body of research and review the main theories that have been proposed to explain human prosociality, with an emphasis on kinship, reciprocity, indirect reciprocity, punishment, and morality. We highlight recent methodological advances that are stimulating research and point to some areas that either remain controversial or merit more attention.

Lau, E., S.-H. Cheung, et al. (2015). **"Purpose-driven life: Life goals as a predictor of quality of life and psychological health."** *Journal of Happiness Studies* 16(5): 1163-1184. <http://dx.doi.org/10.1007/s10902-014-9552-1>

On the basis of self-determination theory, we predicted that the pursuit of material goals might negatively affect quality of life and psychological outcomes including sleep quality and mood states. We further hypothesized that the link between religious affiliation and these outcome variables could be explained, at least partially, by life goals. Longitudinal data collected from 700 Chinese adults demonstrated that for both Christians and non-believers, material goals had a detrimental effect on outcome variables measured 6 months later. More importantly, material goals partially mediated the effects of religious affiliation. That is, Christians were different from non-believers on the outcome variables partly because the former did not go after material goals. For these believers, moreover, the pursuit of religion-based goals brought psychological benefits. Not only can certain life goals explain why people with religious faiths have better psychological health and quality of life, they can also explain why not every religious person feels good and is content about their lives.

Lim, D. and D. DeSteno (2016). **"Suffering and compassion: The links among adverse life experiences, empathy, compassion, and prosocial behavior."** *Emotion*. <http://psycnet.apa.org/?fa=main.doiLanding&doi=10.1037/emo0000144>

Experiencing past adversity traditionally has been linked to negative life outcomes. However, emerging evidence suggests that heterogeneity exists with respect to links between adversity and resilience, with adversity often enhancing cooperation in the face of joint suffering. Here, the authors present 2 studies designed to examine if the severity of past adversity is associated with an enduring propensity for empathy-mediated compassion, and, if so, whether the resulting compassion directly is, in turn, linked to behavior meant to relieve the suffering of others. Using both MTurk and laboratory-based paradigms, the authors find that increasing severity of past adversity predicts increased empathy, which in turn, is linked to a stable tendency to feel compassion for others in need. In addition, they demonstrate that the resulting individual differences in compassion appear to engender behavioral responses meant to assist others (i.e., charitable giving, helping a stranger).

Mansson, K. N., A. Salami, et al. (2016). **"Neuroplasticity in response to cognitive behavior therapy for social anxiety disorder."** *Transl Psychiatry* 6: e727. <http://www.ncbi.nlm.nih.gov/pubmed/26836415>

Patients with anxiety disorders exhibit excessive neural reactivity in the amygdala, which can be normalized by effective treatment like cognitive behavior therapy (CBT). Mechanisms underlying the brain's adaptation to anxiolytic treatments are likely related both to structural plasticity and functional response alterations, but multimodal neuroimaging studies addressing structure-function interactions are currently missing. Here, we examined treatment-related changes in brain structure (gray matter (GM) volume) and function (blood-oxygen level dependent, BOLD response to self-referential criticism) in 26 participants with social anxiety disorder randomly assigned either to CBT or an attention bias modification control treatment. Also, 26 matched healthy controls were included. Significant time x treatment interactions were found in the amygdala with decreases both in GM volume (family-wise error (FWE) corrected  $P(FWE)=0.02$ ) and BOLD responsivity ( $P(FWE)=0.01$ ) after successful CBT. Before treatment, amygdala GM volume correlated positively with anticipatory speech anxiety ( $P(FWE)=0.04$ ), and CBT-induced reduction of amygdala GM volume (pre-post) correlated positively with reduced anticipatory anxiety after treatment ( $P(FWE)0.05$ ). In addition, we observed greater amygdala neural responsivity to self-referential criticism in socially anxious participants, as compared with controls ( $P(FWE)=0.029$ ), before but not after CBT. Further analysis indicated that diminished amygdala GM volume mediated the relationship between decreased neural responsivity and reduced social anxiety after treatment ( $P=0.007$ ). Thus, our results suggest that improvement-related structural plasticity impacts neural responsiveness within the amygdala, which could be essential for achieving anxiety reduction with CBT.

Masland, S. R. and J. M. Hooley (2015). **"Perceived criticism: A research update for clinical practitioners."** *Clinical Psychology: Science and Practice* 22(3): 211-222. <http://dx.doi.org/10.1111/cpsp.12110>

Perceived criticism (PC), an easily obtained measure that can be assessed using a single item, predicts a range of negative clinical outcomes. Evidence suggests that PC is not a proxy for neuroticism or other variables that could be relevant for prognosis. PC also shows incremental predictive validity over related constructs. This may be because PC appears to moderate how the brain processes criticism and how people respond to negative stimuli more generally. Despite evidence supporting PC's concurrent and predictive validity, the measure is not currently used in clinical practice. In an effort to bridge this science-practice gap, we review the PC literature and highlight its clinical relevance. We also provide suggestions for using PC in clinical practice to improve outcomes.

Michalak, J., M. Schultze, et al. (2015). **"A randomized controlled trial on the efficacy of mindfulness-based cognitive therapy and a group version of cognitive behavioral analysis system of psychotherapy for chronically depressed patients."** *J Consult Clin Psychol* 83(5): 951-963. <http://www.ncbi.nlm.nih.gov/pubmed/26371617>

OBJECTIVE: Mindfulness-based cognitive therapy (MBCT) has recently been proposed as a treatment option for chronic depression. The cognitive behavioral analysis system of psychotherapy (CBASP) is the only approach specifically developed to date for the treatment of chronically depressed patients. The efficacy of MBCT plus treatment-as-usual (TAU), and CBASP (group version) plus TAU, was compared to TAU alone in a prospective, bicenter, randomized controlled trial. METHOD: One hundred and six patients with a current DSM-IV defined major depressive episode and persistent depressive symptoms for more than 2 years were randomized to TAU only ( $N = 35$ ), or to TAU with additional 8-week group therapy of either 8 sessions of MBCT ( $n = 36$ ) or CBASP ( $n = 35$ ). The primary outcome measure was the Hamilton Depression Rating Scale (24-item HAM-D, Hamilton, 1967) at the end of treatment. Secondary outcome measures were the Beck Depression Inventory (BDI; Beck, Steer, & Brown, 1996) and measures of social functioning and quality of life. RESULTS: In the overall sample as well as at 1 treatment site, MBCT was no more effective than TAU in reducing depressive symptoms, although it was significantly superior to TAU at the other treatment site. CBASP was significantly more effective than TAU in reducing depressive symptoms in the overall sample and at both treatment sites. Both treatments had only small to medium effects on social functioning and quality of life. CONCLUSIONS: Further studies should inquire whether the superiority of CBASP in this trial might be explained by the more active, problem-solving, and interpersonal focus of CBASP.

Mikolajczak, M., H. Avalosse, et al. (2015). **"A nationally representative study of emotional competence and health."** *Emotion* 15(5): 653-667. <http://www.ncbi.nlm.nih.gov/pubmed/25893449>

Emotional competence (EC; also called "emotional intelligence"), which refers to individual differences in the identification, understanding, expression, regulation, and use of one's emotions and those of others, has been found to be an important predictor of individuals' adaptation to their environment. Higher EC is associated with greater happiness, better mental health, more satisfying social and marital relationships, and greater occupational success. Whereas a considerable amount of research has documented the significance of EC, 1 domain has been crucially under investigated: the relationship between EC and physical health. We examined the relationship between EC and objective health indicators in 2 studies (N1 = 1,310; N2 = 9,616) conducted in collaboration with the largest Mutual Benefit Society in Belgium. These studies allowed us (a) to compare the predictive power of EC with other well-known predictors of health such as age, sex, Body Mass Index, education level, health behaviors (diet, physical activity, smoking and drinking habits), positive and negative affect, and social support; (b) to clarify the relative weight of the various EC dimensions in predicting health; and (c) to determine to what extent EC moderates the effect of already known predictors on health. Results show that EC is a significant predictor of health that has incremental predictive power over and above other predictors. Findings also show that high EC significantly attenuates (and sometimes compensates for) the impact of other risk factors. Therefore, we argue that EC deserves greater interest and attention from health professionals and governments. (PsycINFO Database Record

Peters, K. and Y. Kashima (2015). **"A multimodal theory of affect diffusion."** *Psychol Bull* 141(5): 966-992. <http://www.ncbi.nlm.nih.gov/pubmed/26011791>

There is broad consensus in the literature that affect diffuses through social networks (such that a person may "acquire" or "catch" an affective state from his or her social contacts). It is further assumed that affect diffusion primarily occurs as the result of people's tendencies to synchronize their affective actions (such as smiles and frowns). However, as we show, there is a lack of clarity in the literature about the substrate and scope of affect diffusion. One consequence of this is a difficulty in distinguishing between affect diffusion and several other affective influence phenomena that look similar but have very different consequences. There is also a growing body of evidence that action synchrony is unlikely to be the only, or indeed the most important, pathway for affect diffusion. This paper has 2 key aims: (a) to craft a formal definition of affect diffusion that does justice to the core of the phenomenon while distinguishing it from other phenomena with which it is frequently confounded and (b) to advance a theory of the mechanisms of affect diffusion. This theory, which we call the multimodal theory of affect diffusion, identifies 3 parallel multimodal mechanisms that may act as routes for affect diffusion. It also provides a basis for novel predictions about the conditions under which affect is most likely to diffuse.

Pinto, A., M. Verissimo, et al. (2015). **"Direct and indirect relations between parent-child attachments, peer acceptance, and self-esteem for preschool children."** *Attach Hum Dev* 17(6): 586-598. <http://www.ncbi.nlm.nih.gov/pubmed/26426975>

The present study aims to test Bowlby's suggestions concerning relations between the child's attachment quality with parents and subsequently constructed models of self-worth during early childhood. In most research on this question, attachment with mothers is considered in relation to self-worth but the child's attachment with fathers is not. Neither has the peer group been studied as an influence on child self-esteem, in the context of attachment research. This study addresses these relatively unstudied influences on child self-esteem. Attachment security to mother and father was measured by the Attachment Behavior Q-Set at two and half years of age. At five years of age social acceptance was measured using two sociometric techniques, and the self-esteem with the California Child Q-Sort. Our analyses indicated that security of the attachment to father and peer acceptance are both unique, significant predictors of the children's self-esteem. The security of the attachment to mother was also related to child self-esteem but did not emerge as a uniquely significant predictor. Peer acceptance appeared to moderate the effect of the security of the attachment to father on the self-esteem of children. Our results extend the relatively sparse literature relating early attachments to self-esteem during early childhood.

Proctor, C., R. Tweed, et al. (2015). **"The rogerian fully functioning person: A positive psychology perspective."** *Journal of Humanistic Psychology*. <http://jhp.sagepub.com/content/early/2015/09/25/0022167815605936.abstract>

Two studies examined the characteristics of the Rogerian fully functioning person from the positive psychology perspective. Based on the findings of extant research in support of the Rogerian metatheoretical model, indicators were selected to represent characteristics constituting the fully functioning person. Using confirmatory factor analysis, a single factor structure of the fully functioning person was assessed with young adults aged 16 to 19 years ( $\bar{x} = 16.86$ ). Participants of both studies completed measures of life satisfaction, positive thoughts and feelings, authenticity, organismic valuing, aspirations, basic psychological needs, anxiety, and strengths use. Participants of Study 2 also completed a measure of character strengths endorsement. Analyses revealed that variables consistent with the Rogerian fully functioning person loaded positively on a single "fully functioning person" factor. Overall, results suggest that the fully functioning person is high in life satisfaction, has increased positive thoughts and feelings and decreased negative thoughts and feelings, low anxiety, and moves toward intrinsic values rather than extrinsic values. The fully functioning person component was positively correlated with the character strengths of enthusiasm, bravery, honesty, leadership, and spirituality and negatively correlated with modesty and fairness. Results supplement research indicating strong links between positive psychology and the person-centered theory of Carl Rogers.

Puntscher, S., C. Hauser, et al. (2015). **"The impact of social capital on subjective well-being: A regional perspective."** *Journal of Happiness Studies* 16(5): 1231-1246. <http://dx.doi.org/10.1007/s10902-014-9555-y>

This study analyses the determinants of the most widely used indicators of subjective well-being (SWB), namely life satisfaction and happiness, within European regions. In particular, we assess to what extent these two measures are related to strictly economic factors or alternatively are driven by social and institutional settings. Our analyses extend the corresponding literature by (1) focusing on European regions instead of nations of the whole world and thus allowing for intra-national differences; (2) highlighting the impact of social capital considered in a broad manner covering general trust, institutional trust, associational activity and the close social ties; and (3) modelling possible spatial influences from the neighbouring regions by estimating a spatial error model. The results indicate that such spatial autocorrelations indeed exist and that the various social capital components are major impact factors alongside the conventional determinants health, religion and unemployment, but that income does not exhibit a statistically significant influence on the SWB of the European regions considered.

Raposa, E. B., H. B. Laws, et al. (2015). **"Prosocial behavior mitigates the negative effects of stress in everyday life."** *Clinical Psychological Science*. <http://cpx.sagepub.com/content/early/2015/12/10/2167702615611073.abstract>

Recent theories of stress reactivity posit that, when stressed, individuals tend to seek out opportunities to affiliate with and nurture others to prevent or mitigate the negative effects of stress. However, few studies have tested empirically the role of prosocial behavior in reducing negative emotional responses to stress. The current analyses used daily diary data to investigate whether engaging in prosocial behavior buffered the negative effects of naturally occurring stressors on emotional well-being. Results showed that on a given day, prosocial behavior moderated the effects of stress on positive affect, negative affect, and overall mental health. Findings suggest that affiliative behavior may be an important component of coping with stress and

indicate that engaging in prosocial behavior might be an effective strategy for reducing the impact of stress on emotional functioning.

Reimer, S. G. and D. A. Moscovitch (2015). **"The impact of imagery rescripting on memory appraisals and core beliefs in social anxiety disorder."** *Behaviour Research and Therapy* 75: 48-59.  
<http://www.sciencedirect.com/science/article/pii/S0005796715300474>

Negative mental images in social anxiety disorder (SAD) are often rooted in autobiographical memories of formative, distressing life events. In the present study, 25 participants with SAD retrieved an idiosyncratic negative mental image and associated autobiographical memory. Participants were then randomly assigned either to a single-session of imagery rescripting (IR) targeting the retrieved autobiographical memory or to a non-intervention control condition (no-IR). Outcomes were assessed one week later. Compared to control participants, those who received IR experienced substantial reduction in SAD symptoms accompanied by more positive and less negative appraisals of their autobiographical memories. Moreover, IR relative to no-IR participants reported marked shifts in the content, validity, and accuracy of their memory-derived negative core beliefs about self and others, but not about the world. Results support the promise of IR as a stand-alone intervention for SAD and suggest important directions for future research to enhance our understanding of the cognitive mechanisms that underlie its effects.

Richards, L. (2016). **"For whom money matters less: Social connectedness as a resilience resource in the uk."** *Social Indicators Research* 125(2): 509-535

(Available in free full text) The current literature shows that both absolute and relative income are important for happiness, but there is little work emphasising how the strength of the relationship is dependent on personal and social factors. I hypothesise that social connectedness influences the money-happiness relationship because the effect of money is in part felt through the acquisition of social status, whereas status (and associated psychological benefits such as self-worth) can alternatively be gained through social connectedness. In particular, it is theorised that 'weak ties' when co-existing with good quality informal ties have a separable and additional benefit to subjective well-being, and that it is the socially isolated who have the most to gain from doing well financially. Social connectedness is conceptualised as a 'resilience resource' which has a buffering effect on subjective well-being. Data from the British Household Panel Survey are used, first to establish a measurement schema of connectedness using latent class analysis, and secondly in a multilevel model of life satisfaction with observations from seven consecutive years nested within individuals. The results show that connectedness makes a larger difference to satisfaction in times of financial stress, and that the satisfaction of the socially isolated can 'catch up' to some degree with those with larger networks when things are going well financially. The findings also confirm that those for whom money makes the smallest contribution to happiness are those with both strong and weak ties. Weak ties have an additional benefit compared to having strong ties alone. In summary, connectedness has the power to narrow the well-being gap that exists between times of financial struggle and times of relative comfort. It suggests that the psychological benefits of social integration have the capacity to displace money as a source of status and self-worth, and similarly that the importance of money may be exaggerated where these psychological gains are not available through other domains of life.

Robinson, K. J., L. B. Hoplock, et al. (2015). **"When in doubt, reach out: Touch is a covert but effective mode of soliciting and providing social support."** *Social Psychological and Personality Science* 6(7): 831-839.  
<http://spp.sagepub.com/content/6/7/831.abstract>

Social support is critical to personal and relational well-being. Yet, receiving support appears to be contingent upon adequately conveying need to a receptive partner who both understands and is willing to provide said support. Or is it? We provide the first evidence of a covert haptic support system between adult intimates, showing that literally reaching out to a loved one can result in feeling supported even when the receiver of haptic support requests does not perceive them as bids for comfort. We tested this by unobtrusively observing support interactions between dating partners. As expected, those experiencing distress were more likely to seek touch from their partners, which elicited responsive touch—even though receivers failed to discern need from support-seekers' touch. Importantly, those who received responsive touch from their romantic partners felt more supported. Because touch begets touch, clear communication between intimates is not always necessary for successful support interactions.

Sani, F., V. Madhok, et al. (2015). **"Greater number of group identifications is associated with healthier behaviour: Evidence from a scottish community sample."** *British Journal of Health Psychology* 20(3): 466-481.  
<http://dx.doi.org/10.1111/bjhp.12119>

Objectives This paper investigates the interplay between group identification (i.e., the extent to which one has a sense of belonging to a social group, coupled with a sense of commonality with in-group members) and four types of health behaviour, namely physical exercise, smoking, drinking, and diet. Specifically, we propose a positive relationship between one's number of group identifications and healthy behaviour. Design This study is based on the Scottish portion of the data obtained for Wave 1 of the two-wave cross-national Health in Groups project. Totally 1,824 patients from five Scottish general practitioner (GP) surgeries completed the Wave 1 questionnaire in their homes. Methods Participants completed measures of group identification, group contact, health behaviours, and demographic variables. Results Results demonstrate that the greater the number of social groups with which one identifies, the healthier one's behaviour on any of the four health dimensions considered. Conclusions We believe our results are due to the fact that group identification will generally (1) enhance one's sense of meaning in life, thereby leading one to take more care of oneself, (2) increase one's sense of responsibility towards other in-group members, thereby enhancing one's motivation to be healthy in order to fulfil those responsibilities, and (3) increase compliance with healthy group behavioural norms. Taken together, these processes amply overcompensate for the fact that some groups with which people may identify can actually prescribe unhealthy behaviours. Statement of contribution What is already known on this subject? Researchers from a number of disciplines – especially social epidemiologists – have investigated the link between social ties and health behaviour in the past. These researchers have shown that, overall, greater ties predict healthier behaviour. However, the vast majority of studies have operationalized 'social ties' as the amount of contact (e.g., frequency of interactions) with close others or members of relevant groups, while generally neglecting the subjective dimension of ties with others and groups (e.g., sense of belonging and affiliation). More recently, some researchers have begun to look at the link between group identification and health behaviour. However, to date, this new research approach has focussed on the linear association between identification with one specific group and health behaviours. What does this study add? \* This is the first quantitative study looking at the impact of one's number of high group identifications on four crucial health behaviours (smoking, drinking, exercise, and diet) in a large community sample. \* This is the first study that looks at how number of group identifications and number of contact-intensity groups compare, in terms of their effects on health behaviours.

Shallcross, A. J., J. J. Gross, et al. (2015). **"Relapse prevention in major depressive disorder: Mindfulness-based cognitive therapy versus an active control condition."** *J Consult Clin Psychol* 83(5): 964-975. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4571290/>

(Free full text available) OBJECTIVE: We evaluated the comparative effectiveness of mindfulness-based cognitive therapy (MBCT) versus an active control condition (ACC) for depression relapse prevention, depressive symptom reduction, and improvement in life satisfaction. METHOD: Ninety-two participants in remission from major depressive disorder with residual depressive symptoms were randomized to either an 8-week MBCT or a validated ACC that is structurally equivalent to MBCT and controls for nonspecific effects (e.g., interaction with a facilitator, perceived social support, treatment outcome expectations). Both interventions were delivered according to their published manuals. RESULTS: Intention-to-treat analyses indicated no differences between MBCT and ACC in depression relapse rates or time to relapse over a 60-week follow-up. Both groups experienced significant and equal reductions in depressive symptoms and improvements in life satisfaction. A significant quadratic interaction (Group x Time) indicated that the pattern of depressive symptom reduction differed between groups. The ACC experienced immediate symptom reduction postintervention and then a gradual increase over the 60-week follow-up. The MBCT group experienced a gradual linear symptom reduction. The pattern for life satisfaction was identical but only marginally significant. CONCLUSIONS: MBCT did not differ from an ACC on rates of depression relapse, symptom reduction, or life satisfaction, suggesting that MBCT is no more effective for preventing depression relapse and reducing depressive symptoms than the active components of the ACC. Differences in trajectory of depressive symptom improvement suggest that the intervention-specific skills acquired may be associated with differential rates of therapeutic benefit. This study demonstrates the importance of comparing psychotherapeutic interventions to active control conditions.

Smallwood, J. and J. W. Schooler (2015). **"The science of mind wandering: Empirically navigating the stream of consciousness."** *Annual Review of Psychology* 66(1): 487-518. <http://www.annualreviews.org/doi/abs/10.1146/annurev-psych-010814-015331>

Conscious experience is fluid; it rarely remains on one topic for an extended period without deviation. Its dynamic nature is illustrated by the experience of mind wandering, in which attention switches from a current task to unrelated thoughts and feelings. Studies exploring the phenomenology of mind wandering highlight the importance of its content and relation to meta-cognition in determining its functional outcomes. Examination of the information-processing demands of the mind-wandering state suggests that it involves perceptual decoupling to escape the constraints of the moment, its content arises from episodic and affective processes, and its regulation relies on executive control. Mind wandering also involves a complex balance of costs and benefits: Its association with various kinds of error underlines its cost, whereas its relationship to creativity and future planning suggest its potential value. Although essential to the stream of consciousness, various strategies may minimize the downsides of mind wandering while maintaining its productive aspects. (See too Jonathan Smallwood's website <http://themindwanders.com/> ).

Tamir, M., S. H. Schwartz, et al. (2015). **"Desired emotions across cultures: A value-based account."** *J Pers Soc Psychol*. <http://www.ncbi.nlm.nih.gov/pubmed/26524003>

Values reflect how people want to experience the world; emotions reflect how people actually experience the world. Therefore, we propose that across cultures people desire emotions that are consistent with their values. Whereas prior research focused on the desirability of specific affective states or 1 or 2 target emotions, we offer a broader account of desired emotions. After reporting initial evidence for the potential causal effects of values on desired emotions in a preliminary study (N = 200), we tested the predictions of our proposed model in 8 samples (N = 2,328) from distinct world cultural regions. Across cultural samples, we found that people who endorsed values of self-transcendence (e.g., benevolence) wanted to feel more empathy and compassion, people who endorsed values of self-enhancement (e.g., power) wanted to feel more anger and pride, people who endorsed values of openness to change (e.g., self-direction) wanted to feel more interest and excitement, and people who endorsed values of conservation (e.g., tradition) wanted to feel more calmness and less fear. These patterns were independent of differences in emotional experience. We discuss the implications of our value-based account of desired emotions for understanding emotion regulation, culture, and other individual differences. (PsycINFO Database Record

Vachon, D. D., R. F. Krueger, et al. (2015). **"Assessment of the harmful psychiatric and behavioral effects of different forms of child maltreatment."** *JAMA Psychiatry* 72(11): 1135-1142. <http://dx.doi.org/10.1001/jamapsychiatry.2015.1792>

Importance Several widely held beliefs about child abuse and neglect may be incorrect. It is most commonly assumed that some forms of abuse (eg, physical and sexual abuse) are more harmful than others (eg, emotional abuse and neglect); other assumptions are that each form of abuse has specific consequences and that the effects of abuse differ across sex and race. Objective To determine whether widely held assumptions about child abuse and neglect are valid by testing the hypothesis that different types of child maltreatment (CM) actually have equivalent, broad, and universal effects. Design, Setting, and Participants This observational study assessed 2292 racially and ethnically diverse boys (1254 [54.7%]) and girls (1038 [45.3%]) aged 5 to 13 years (mean [SD] age, 9.0 [2.0] years) who attended a research summer camp program for low-income, school-aged children from July 1, 1986, to August 15, 2012. Of these children, 1193 (52.1%) had a well-documented history of maltreatment. Analysis was conducted from September 25, 2013, to June 1, 2015. Main Outcomes and Measures Various forms of internalizing and externalizing personality and psychopathologic traits were assessed using multiple informant ratings on the California Child Q-Set and Teacher Report Form as well as child self-reported depression and peer ratings of aggression and disruptive behavior. Results Structural analysis showed that different forms of CM have equivalent psychiatric and behavioral effects, ranging from anxiety and depression to rule-breaking and aggression. We also found that nonsexual CM alters 2 broad vulnerability factors, internalizing ( $\beta = 0.185$ ; SE = 0.028;  $P < .001$ ) and externalizing ( $\beta = 0.283$ ; SE = 0.023;  $P < .001$ ), that underlie multiple forms of psychiatric and behavioral disturbance. We show that CM has comparable consequences for boys and girls of different races, and our results allowed us to describe a base rate and co-occurrence issue that makes it difficult to identify the unique effects of child sexual abuse. Conclusions and Relevance Our findings challenge widely held beliefs about how child abuse should be recognized and treated—a responsibility that often lies with the physician. Because different types of child abuse have equivalent, broad, and universal effects, effective treatments for maltreatment of any sort are likely to have comprehensive psychological benefits. Population-level prevention and intervention strategies should emphasize emotional abuse, which occurs with high frequency but is less punishable than other types of child maltreatment.

Veehofab, M. M., H. R. Trompettera, et al. (2016). **"Acceptance- and mindfulness-based interventions for the treatment of chronic pain: A meta-analytic review."** *Cognitive Behaviour Therapy*. [http://www.tandfonline.com/doi/abs/10.1080/16506073.2015.1098724?utm\\_content=buffer56f4a&utm\\_medium=social&utm\\_source=twitter.com&utm\\_campaign=buffer](http://www.tandfonline.com/doi/abs/10.1080/16506073.2015.1098724?utm_content=buffer56f4a&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer)

The number of acceptance- and mindfulness-based interventions for chronic pain, such as acceptance and commitment therapy (ACT), mindfulness-based stress reduction (MBSR), and mindfulness-based cognitive therapy (MBCT), increased in recent years. Therefore an update is warranted of our former systematic review and meta-analysis of studies that reported

effects on the mental and physical health of chronic pain patients. Pubmed, EMBASE, PsycInfo and Cochrane were searched for eligible studies. Current meta-analysis only included randomized controlled trials (RCTs). Studies were rated for quality. Mean quality did not improve in recent years. Pooled standardized mean differences using the random-effect model were calculated to represent the average intervention effect and, to perform subgroup analyses. Outcome measures were pain intensity, depression, anxiety, pain interference, disability and quality of life. Included were twenty-five RCTs totaling 1285 patients with chronic pain, in which we compared acceptance- and mindfulness-based interventions to the waitlist, (medical) treatment-as-usual, and education or support control groups. Effect sizes ranged from small (on all outcome measures except anxiety and pain interference) to moderate (on anxiety and pain interference) at post-treatment and from small (on pain intensity and disability) to large (on pain interference) at follow-up. ACT showed significantly higher effects on depression and anxiety than MBSR and MBCT. Studies' quality, attrition rate, type of pain and control group, did not moderate the effects of acceptance- and mindfulness-based interventions. Current acceptance- and mindfulness-based interventions, while not superior to traditional cognitive behavioral treatments, can be good alternatives.

Wilson, B. M., L. Mickes, et al. (2015). **"Increased false-memory susceptibility after mindfulness meditation."** *Psychological Science* 26(10): 1567-1573. <http://pss.sagepub.com/content/26/10/1567.abstract>

The effect of mindfulness meditation on false-memory susceptibility was examined in three experiments. Because mindfulness meditation encourages judgment-free thoughts and feelings, we predicted that participants in the mindfulness condition would be especially likely to form false memories. In two experiments, participants were randomly assigned to either a mindfulness induction, in which they were instructed to focus attention on their breathing, or a mind-wandering induction, in which they were instructed to think about whatever came to mind. The overall number of words from the Deese-Roediger-McDermott paradigm that were correctly recalled did not differ between conditions. However, participants in the mindfulness condition were significantly more likely to report critical nonstudied items than participants in the control condition. In a third experiment, which tested recognition and used a reality-monitoring paradigm, participants had reduced reality-monitoring accuracy after completing the mindfulness induction. These results demonstrate a potential unintended consequence of mindfulness meditation in which memories become less reliable.

Zeidan, F., N. M. Emerson, et al. (2015). **"Mindfulness meditation-based pain relief employs different neural mechanisms than placebo and sham mindfulness meditation-induced analgesia."** *The Journal of Neuroscience* 35(46): 15307-15325. <http://www.jneurosci.org/content/35/46/15307.abstract>

**ABSTRACT** Mindfulness meditation reduces pain in experimental and clinical settings. However, it remains unknown whether mindfulness meditation engages pain-relieving mechanisms other than those associated with the placebo effect (e.g., conditioning, psychosocial context, beliefs). To determine whether the analgesic mechanisms of mindfulness meditation are different from placebo, we randomly assigned 75 healthy, human volunteers to 4 d of the following: (1) mindfulness meditation, (2) placebo conditioning, (3) sham mindfulness meditation, or (4) book-listening control intervention. We assessed intervention efficacy using psychophysical evaluation of experimental pain and functional neuroimaging. Importantly, all cognitive manipulations (i.e., mindfulness meditation, placebo conditioning, sham mindfulness meditation) significantly attenuated pain intensity and unpleasantness ratings when compared to rest and the control condition ( $p < 0.05$ ). Mindfulness meditation reduced pain intensity ( $p = 0.032$ ) and pain unpleasantness ( $p < 0.001$ ) ratings more than placebo analgesia. Mindfulness meditation also reduced pain intensity ( $p = 0.030$ ) and pain unpleasantness ( $p = 0.043$ ) ratings more than sham mindfulness meditation. Mindfulness-meditation-related pain relief was associated with greater activation in brain regions associated with the cognitive modulation of pain, including the orbitofrontal, subgenual anterior cingulate, and anterior insular cortex. In contrast, placebo analgesia was associated with activation of the dorsolateral prefrontal cortex and deactivation of sensory processing regions (secondary somatosensory cortex). Sham mindfulness meditation-induced analgesia was not correlated with significant neural activity, but rather by greater reductions in respiration rate. This study is the first to demonstrate that mindfulness-related pain relief is mechanistically distinct from placebo analgesia. The elucidation of this distinction confirms the existence of multiple, cognitively driven, supraspinal mechanisms for pain modulation. **SIGNIFICANCE STATEMENT** Recent findings have demonstrated that mindfulness meditation significantly reduces pain. Given that the "gold standard" for evaluating the efficacy of behavioral interventions is based on appropriate placebo comparisons, it is imperative that we establish whether there is an effect supporting meditation-related pain relief above and beyond the effects of placebo. Here, we provide novel evidence demonstrating that mindfulness meditation produces greater pain relief and employs distinct neural mechanisms than placebo cream and sham mindfulness meditation. Specifically, mindfulness meditation-induced pain relief activated higher-order brain regions, including the orbitofrontal and cingulate cortices. In contrast, placebo analgesia was associated with decreased pain-related brain activation. These findings demonstrate that mindfulness meditation reduces pain through unique mechanisms and may foster greater acceptance of meditation as an adjunct pain therapy.