

FINAL DRAFT 21.11.18

Mindfulness and Education

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Key words: classroom; cognitive; compassion; executive function; learning; mindfulness; primary/elementary school; secondary/high school; tertiary/higher education; schools; self-compassion; self-regulation; social-emotional learning

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Introduction

This article focuses on the literature on mindfulness and mindfulness meditation with children and young people in schools and in higher education, and touches on mindfulness for adult educators including teachers, and on the overlapping field of contemplative education in higher education. It is a selective guide to the theoretical, research and practice-based literature in a rapidly evolving field and is aimed at those unfamiliar with the territory. Work with young people cannot be understood in isolation, so the article begins by going back to first principles, looking at issues of definitions and origins of mindfulness from within ancient wisdom traditions, most particularly, but not exclusively, its Buddhist origins. It then contextualises work with young people within the rapid rise of secular mindfulness for adult populations over the last forty years, explores modern scientifically based definitions, and the domination of the therapeutically based model of mindfulness as an 'intervention', touching on some concerns and critiques, and outlining how mindfulness is currently being measured in adults and young people. It moves on to an account of overviews of mindfulness in education, citing the best of the plethora of guidance on how mindfulness might be implemented in schools, universities and classrooms. It outlines the key literature on the rapidly expanding world of contemplative education, which is asking rather different questions to those raised by the model of mindfulness as an 'intervention', being more firmly based in philosophical and educational approaches. The world of classroom curricula is a burgeoning and lively one, and the article cites some of the best evidenced and most positively reviewed resources. There is a growing and promising evidence base to guide the field, and the last part of the article outlines the main reviews, which between them suggest there is a small to moderate impact of mindfulness when well taught and implemented. The article ends by looking in more detail at the core literature in main areas in which mindfulness appears to be showing impact, including: psycho-social well-being and mental health; social and emotional skills including compassion and kindness; cognition, executive function, learning and academic attainment; and physical health. See too the article in *Oxford Bibliographies in Education, Mindfulness, Learning and Education*, which has overlaps with this article, but explores in more detail definitions, overviews and websites and the implications for learning, while this article has a stronger focus on psychological mechanisms,

measurement and the empirical evidence base. They are probably best consulted together for a full understanding.

Definition and Origins of Mindfulness

Put simply, mindfulness is the ability to be aware of our experience as it is happening, while maintaining an attitude of openness, curiosity and kindness. The term 'mindfulness' is used in a wide variety of ways in the literature and there is naturally controversy and debate. The school of thought which has emerged as mainstream, including in education, emanates from the seminal work Kabat-Zinn 2004, and sees formal practice, including mindfulness meditation, as essential to cultivate the skills, habits of mind and neural pathways that enable us to sustain and maintain an attentional focus on present experience. This meditation-based approach is the type of mindfulness covered in this bibliography. (There are rather different definitions which have had some influence within education, mostly particularly mindfulness as the drawing of novel distinctions, rather than as a practice based on meditation. See the separate *Oxford Bibliographies in Psychology* article *Mindfulness [obo-9780199828340-0036]* which uses this perspective.) The key journal in the field, *Mindfulness* publishes papers from across a wide variety of traditional and modern approaches. It reflects the fact that techniques to cultivate mindfulness which can help maintain attitudes of peacefulness, clarity, calm, steadiness, open mindedness and compassion in the midst of our busy lives, have been taught in many religious and wisdom traditions from both East and West, and that there are many kinds of mindfulness practice, including meditation, contemplation, self-understanding, kindness and compassion practice. Mindfulness, including mindfulness-based meditation, is most strongly linked to Buddhism, where it is seen as an essential part of the path which leads to the reduction of human discontent by helping to cultivate a disciplined and equanimous mind, a path which includes a wide range of attitudes, actions and intentions which underpin the leading of a wholesome and ethical life. See the separate *Oxford Bibliographies in Buddhism* article 'Mindfulness'. Some literature on currently popular approaches, such as Nhat Hanh 2008, continues to present mindfulness within this ancient Buddhist lineage, and the appeal of such an approach is increasing as modern secular mindfulness spreads and people seek to deepen their understanding of its origins and their own practice. For a more detailed discussion of Nhat Hanh, a seminal figure in mindfulness, see the separate *Oxford Bibliographies in Buddhism* article 'Thich Nhat Hanh'. There is also a growing literature on compassion, self-compassion and befriending practice and meditation, which have a strong appeal to the western self-critical mind, as noted in Feldman 2017. Buddhism continues to have influence and manifestations

within mindfulness in education, while in higher education the overlapping field of contemplative education is inspired by both Buddhism and a wider range of wisdom traditions, explored in *Contemplative Education*.

Kabat-Zinn, Jon. *Wherever You Go, There You Are: Mindfulness Meditation in Everyday Life*. New York: Hyperion, 2004.

This is a seminal book on the role of mindfulness meditation in day-to-day life. Although not a scientific work, it offers one of the most widely cited definitions of mindfulness and is a highly accessible and inspirational read. It is widely regarded as having launched mindfulness meditation into mainstream public consciousness.

Mindfulness: Springer ISSN: 1868-8527 (print version) ISSN: 1868-8535 (electronic version)

This is the main journal in the field and publishes peer-reviewed papers that examine the latest research findings and best practices in mindfulness. It explores the nature and foundations of mindfulness, mechanisms of actions, and its use across cultures. Papers cover the full spectrum of professions and client groups, and draw on the full range of disciplines, including psychology, psychiatry, medicine, neurobiology, psycho-neuroendocrinology, cognitive, behavioural, cultural, philosophy, education, spirituality, and wisdom traditions.

Nhat Hanh, Thich. *The Miracle of Mindfulness: The Classic Guide to Meditation by the World's Most Revered Master (Classic Edition)* Rider: London. 2008

Written by the world respected Zen Master, poet, Noble peace prize nominee, and prolific and highly influential author on mindfulness, this is perhaps his most accessible and seminal work. It offers a philosophical and practical guide to mindfulness in everyday life, using familiar objects and situations to give a framework on which to build meditation, and maintain a more healthful, relaxed, and harmonious outlook.

Feldman, Christina. *The Boundless Heart: The Buddha's Path of Kindness, Compassion, Joy and Equanimity*. New York: Penguin/Random House, 2017.

This book, written by a highly respected and popular western mindfulness meditation teacher, one of the first to bring Buddhism to the west, outlines the theoretical base for compassion and gives detailed instructions for attitudes, practices and meditations which cultivate mindfulness, compassion, kindness, equanimity and joy.

The Growth of Secular Mindfulness

In the western mainstream the cultivation of mindfulness has generally moved from its philosophical and religious roots in the East into the more secular and scientific perspectives of the West. The term, if not the accurate understanding of it, has entered popular consciousness and the growth is nothing short of explosive, with publications, research, conferences, programmes and courses increasing exponentially year by year. Jon Kabat-Zinn is a prolific and accessible writer and his works Kabat-Zinn 2004 and Kabat-Zinn 2013 serve as sound introductions to the whole area. He is usually credited with starting the secular mindfulness wave in the mid-1970s. His 8-week MBSR program was developed originally for patients in a hospital setting in the US, and since then has been used increasingly to enhance the quality of life in general population settings. Work in the UK has taken a slightly different emphasis with the development of the closely related Mindfulness-Based Cognitive Therapy (MBCT) program, which is aimed particularly at those with recurrent depression. The success and major influence of both MBSR and MBCT can be attributed in part to them both having a tried and tested curriculum and manual for teachers, with Kabat-Zinn 2013 outlining MBSR and Segal et al. 2012 outlining MBCT. They are supported by several self-help texts by the same teams, for example the MBCT workbook by Teasdale and Williams 2014, widely used as a workbook on mindfulness courses. The meditations that form the core curriculum of MBSR, MBCT and indeed of most mindfulness-based interventions, generally incorporate breathing techniques/breath awareness, and present moment awareness (watching thoughts, feelings, sounds and bodily sensations come and go). They often include mindful movement, mindful eating, relaxation, and body scan/body awareness, and sometimes compassion based/befriending practice. This core curriculum and the concept of a mindfulness-based intervention (MBI) with a finite length, a protocol and manual, and 'outcomes' that can be measured quantitatively have established empirical and testable evidence of benefits. This has had a massive influence, as documented in *Reviews of the Quantitative Evidence Base for Mindfulness with School Aged Youth*. The literature also reflects the many other ways of approaching mindfulness, which go beyond the one-off MBI. The overlapping and slightly broader strand of 'contemplative inquiry', which is explored in *Contemplative Education*, focuses on the integration of a range of contemplative practices into the core processes of teaching and learning, with mindfulness meditation at the heart. Similarly, works such as Kabat-Zinn 2013 clearly recognize the value of ongoing practice and integrating mindfulness into everyday life, emphasizing that MBIs are most effective when they lay the early foundations for

a new way of approaching experience, which for some people turns into a transformative path which shapes their whole way of life.

Kabat- Zinn, Jon. *Full Catastrophe Living, Revised Edition: How to Cope with Stress, Pain and Illness Using Mindfulness Meditation*. Barnes and Noble, Peabody Massachusetts. 2013.

The original, evidence based, teaching and self-help manual based on the original MBSR programme at the University of Massachusetts Medical Centre, used to help thousands of people cope with stress, anxiety, pain and illness. This new edition has been revised and updated to include the latest research.

Segal, Zindel, Williams, Mark, G. and Teasdale, John. *Mindfulness-Based Cognitive Therapy for Depression*, Second Edition Guildford New York 2012

The second edition of the finely crafted, tried and tested, step by step teaching manual for the 8-week MBCT course, which first introduced mindfulness as an evidence-based response depression into the UK. It encourages clinicians teaching the course to practice mindfulness themselves as the essential prerequisite to teaching others. The new edition is based on a decade's worth of developments in MBCT research, clinical practice and training and comes with on line handouts for teachers, and downloads.

Teasdale, John and Williams, Mark. *The Mindful Way Workbook: An 8 Week Programme to Free Yourself from Depression and Emotional Distress*. 2014.

A popular self-help workbook that matches chapter for chapter the 8-week MBCT program, with instructions, a CD of practices, reflection questions, tools for keeping track of progress, and comments from real life participants who have gone through the program.

What Does Mindfulness Mean and How Might it Work in Practice?

To understand mindfulness, it may help to explore the literature on what we know of how it works at the psychological and neurobiological levels. This literature views mindfulness as a form of mental training that develops several important processes, both cognitive and non-cognitive/ attitudinal, and impacts on the structure and function of the brain. The most basic cognitive process developed by mindfulness practice is awareness of what is being experienced in the body and the mind (sensations, thoughts, and emotions). As described by Shonin et al. 2016, this involves the ability to stand back from our experience and observe it while it is taking place, rather than being caught up in it and identifying with it. This ability, sometimes referred to

as meta-cognition, allows us to view our experiences more objectively, and hence make better choices. Vago and Silbersweig 2012 outlines a theoretical framework for understanding how mindfulness may work at the psychological and neurobiological levels which include the development of attentional control - the ability to focus, maintain, and shift attention when we choose to. These processes are forms of self-regulation which is a critical component of 'executive function'. It is generally agreed that there are three core executive functions: working memory, cognitive flexibility, and inhibition, from which higher-order executive functions such as reasoning, problem solving, and planning, are built. Tang et al. 2012 examines the beneficial effects of mindfulness training on these skills which are crucial for success in school and in life. Evidence that children with poorer executive functions may show the greatest benefit from mindfulness training is discussed in Flook et al. 2010 and explored in more detail in *Developing Cognition - Executive Function, Learning, Attainment, Reflection, Wisdom*. Further, Bishop et al. 2004 suggests mindfulness also promotes particular attitudes towards our experience-interest, openness, curiosity, acceptance, non-judgement, and kindness. These attitudes are believed to account for many of the benefits of mindfulness, particularly for mental health and well-being; for instance, a sense of curiosity encourages us to investigate whatever we are experiencing, even difficult sensations, thoughts or feelings. Neff 2003 has shown that learning to accept in a kindly way what we are experiencing (self-compassion) helps reduce self-judgment and self-criticism. An increase in self-compassion appears to be a key mediator of the effect of mindfulness training on relapse prevention in depressed patients, as demonstrated by Kuyken et al. 2010. Neuroimaging studies lend support to these proposed psychological mechanisms by showing that the practice of mindfulness can reliably change the structure and function of the brain, for example, in areas associated with decision-making and rational thinking, emotion regulation, learning and memory, kindness and compassion, as shown for example in the seminal study by Hölzel et al. 2011.

Bishop, S.R., Lau, M., Shapiro, S., Carlson, L., Anderson, N.D., Carmody, J., Segal, Z.V., Abbey, S., Speca, M., Velting, D., and Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, 11(3), 230-241.

This paper describes the outcome of a series of meetings to establish a consensus on how to conceptualize mindfulness and develop a testable operational definition. A two-component model of mindfulness is proposed which comprises (a) self-regulation of attention so that it is directed towards immediate experience, thereby facilitating awareness of mental events in

the present moment and (b) adopting a particular orientation toward one's experiences in the present moment, that is characterized by curiosity, openness, and acceptance.

Flook, L., Smalley, S.L., Kitil, M.J., Galla, B.M., Kaiser-Greenland, S., Locke, J., Ishijima, E. & Kasari, C., 2010. Effects of mindful awareness practices on executive functions in elementary school children. *Journal of Applied School Psychology*, 26(1), 70-95.

Describes an RCT of the effects of mindfulness training on executive functions in 7-9-year olds. Teachers and parents rated children on a behavioural inventory of executive functions. Although there were no significant differences overall between the mindfulness and control groups, children with poorer executive function showed significant improvements in behaviour regulation, metacognition, and overall global executive control compared to the control group. These improvements were reported by both teachers and parents.

Hölzel, B.K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T. and Lazar, S.W. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research: Neuroimaging*, 191(1), 36-43.

This is one of the first studies to directly examine structural changes in the brain following mindfulness training. Magnetic resonance imaging was conducted on a group of 16 meditation-naïve adults before and after a standard 8-week MBSR course and was compared with a waitlist control group. The authors found that mindfulness training is associated with increased density of neurons in brain regions involved in learning and memory processes, emotion regulation, self-referential processing, and perspective taking.

Kuyken, W., Watkins, E., Holden, E., White, K., Taylor, R.S., Byford, S., Evans, A., Radford, S., Teasdale, J.D. and Dalgleish, T.(2010). How does mindfulness-based cognitive therapy work?. *Behaviour Research and Therapy*, 48(11), 1105-1112.

This paper examines which of the many psychological changes following Mindfulness Based Cognitive Therapy (MBCT) mediates its effects in treating mental health problems. 123 patients with recurrent depression were randomised into a MBCT group or usual drug treatment. Their results show that the primary mediators of MBCT's effects were increases in mindfulness and self-compassion.

Neff, K. (2003). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, 2(2), 85-101.

This is a seminal paper which explores the role of self-compassion in mental health and well-being. It is proposed that self-compassion is an emotionally positive self-attitude that can protect against the negative consequences of self-judgment, isolation, and rumination. Mindfulness is recognised as one of the three main components of self-compassion, along with self-kindness and common humanity.

Shonin, E. and Van Gordon, W. (2016). The mechanisms of mindfulness in the treatment of mental illness and addiction. *International Journal of Mental Health and Addiction*, 14(5), 844-849.

Usefully summarizing a diverse body of scientific literature on the effects of mindfulness in the treatment of mental health problems, the authors establish that mindfulness targets biological, psychological, social, and spiritual determinants of both mental health and illness. They identify 10 noteworthy and evidence-based mechanisms of mindfulness: structural brain changes, reduced autonomic arousal, perceptual shift, increase in spirituality, greater situational awareness, values clarification, increase in self-awareness, addiction substitution, urge surfing, and letting go.

Tang, Y.Y., Yang, L., Leve, L.D. and Harold, G.T. (2012). Improving executive function and its neurobiological mechanisms through a mindfulness-based intervention: Advances within the field of developmental neuroscience. *Child Development Perspectives*, 6(4), 361-366.

This paper describes several studies examining the effects of mindfulness training on executive functions. Participants were children in primary, middle and secondary school as well as undergraduates. A particular strength of the study design is the use of an RCT versus an active control group receiving relaxation training. Improvements in executive function were greater in the mindfulness group than in the relaxation controls. The authors recommend that early mindfulness training could reduce the cascade of risk behaviours for children and adolescents.

Tang, Y.Y., Hölzel, B.K. and Posner, M.I., 2015. The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, 16, 213.

A review of the functional and structural effects of mindfulness using brain imaging is integrated with the current conceptual understanding of the psychological and behavioural mechanisms of mindfulness. Current progress in understanding the effects of mindfulness on attention, emotion regulation and self-awareness is highlighted. The authors urge caution in

interpreting existing data and suggest more methodologically rigorous studies are required to gain a full understanding of the mechanisms of mindfulness.

Vago, D.R. and Silbersweig, D.A. (2012). Self-awareness, self-regulation, and self-transcendence (S-ART): A framework for understanding the neurobiological mechanisms of mindfulness. *Frontiers in Human Neuroscience*, 6, 296.

This theoretical framework integrates psychological and neurobiological approaches to understanding the mechanisms of mindfulness. It explores the role of processes including attention regulation, intention, motivation, emotion regulation, and decentering in creating a sustainable healthy mind and promoting prosocial attitudes and behaviours. Simple and clear diagrams are a valuable aid in understanding the systems-based neurobiological mode and potential impacts, which may help to explore what we know of how mindfulness may work at the psychological and neurobiological levels.

The Spread of Mindfulness-based Interventions – and Some Criticisms

The model of mindfulness, expressed in MBSR and MBCT, as a defined 'intervention' based on health and psycho-therapeutic approaches, with a clear protocol and curriculum, has had a powerful influence on publishing, research and development around mindfulness. It has given rise to a wide range of courses, manuals and self-help books which cover many contexts, including the educational MBIs cited throughout this bibliography. Some respected, evidence based manuals include: Burch and Penman 2012 which explores the relationship of mindfulness to physical health and illness and is based on the highly respected the 'Breathworks' approach; Chaskalson 2011, written by an experienced trainer who works in occupational settings looks at mindfulness and the workplace; the popular and accessible book Williams and Penman 2011, written by one of the originators of MBCT in the UK, which covers mindfulness and everyday stress reduction; while an innovative text by two respected innovators in the field of mindfulness and compassion, Neff and Germer 2018, outlines work on compassion, a theme which is coming to greater prominence in the field. There have been several meta-analyses which attempt to summarise numerically the impact of mindfulness: a recent one, Khoury et al. 2015, is representative of the consensus in concluding that MBIs can have a replicable and demonstrable impact on a wide range of indicators of well-being, mental and physical health, learning and performance. However, the literature is starting to demonstrate some concerns

about the rapid growth and spread of mindfulness in the west and Van Dam 2016 considers the extent to which mindfulness, divorced from its original spiritual and ethical roots has sometimes been the subject of a degree of over simplification, commercialism, oversell and 'hype', leading to the inevitable criticism and backlash. There have been concerns expressed about safety and adverse effects of meditation, including in education. The whole issue of the dangers of mindfulness is carefully reviewed in a piece by two highly respected academics, Baer and Kuyken 2016, which, in a web-based piece, comes to cautiously positive conclusions. It is also clear that well-constructed MBIs and their accompanying manuals and handbooks written by leaders in the field, such as Kabat-Zinn 2016, stress the need to take care of participants, are cautious about overclaims, and encourage readers to apply mindfulness in their everyday lives, and to consider its value as part of wider and broader attempt to lead a more meaningful and ethically based existence with greater kindness, compassion and altruism.

Burch, Vidyamala and Penman, Danny. *Mindfulness for Health: A Practical Guide to Relieving Pain, Reducing Stress and Restoring Well-being*. London: Little Brown, 2012.

Winner of the British Medical Association best book on popular medicine 2014, this is a self-help manual of simple practices to incorporate mindfulness into daily life to relieve chronic pain and the suffering and stress of illness. Based on the Breathworks programme developed by the author, to help her cope with the severe pain of her own spinal injury, the highly credible programme is now taught around the world.

Chaskalson, Michael. *The Mindful Workplace: Developing Resilient Individuals and Resonant Organizations with MBSR*. Bognor Regis: Wiley-Blackwell, 2011.

Written by a respected mindfulness expert and leading corporate trainer the book offers a practical and theoretical guide to the benefits of MBSR in the workplace, and details an eight-week mindfulness training course to help people in organizations to listen more attentively, communicate more clearly, manage stress and foster strong relationships.

Williams, Mark G and Penman, Danny. *Mindfulness: A Practical Guide to Finding Peace in a Frantic World*. London: Little Brown. 201.

The first author is one of the originators of MBCT, including its research and practice base. This readable and bestselling book is both a self-help manual and used as the textbook for many 8-week MBCT and MBSR courses, and the chapters follow that curriculum structure, weaving in the evidence base. It explores mindful approaches to everyday unhappiness,

stress, sadness, anxiety and irritability and aims to help ordinary people boost their happiness and confidence levels.

Neff, Kristin and Germer, Christopher. *The Mindful Self-Compassion Workbook: A Proven Way to Accept Yourself, Build Inner Strength, and Thrive*. Peabody Massachusetts, Barnes and Noble, 2018.

A self-help resource based on the authors' popular and widespread 8-week Mindful Self-Compassion program. Chapters give guided meditations supported by audio downloads and informal practices, illustrated with first person accounts of their application to a wide range of human challenges and concerns.

Khoury, Bassam, Manoj Sharma, Sarah E. Rush, and Claude Fournier. "Mindfulness-based stress reduction for healthy individuals: a meta-analysis." *Journal of Psychosomatic Research* 78, no. 6 (2015): 519-528.

A systematic review of 29 quantitative studies that used MBSR as an intervention, conducted with healthy adults, and that investigated stress or anxiety. It found large effects on stress, moderate effects on anxiety, depression, distress, and quality of life, and small effects on burnout, which were maintained for an average of 19 weeks of follow-up. However, the studies were very diverse, which makes easy comparison difficult and the authors call for more research to identify the most effective elements of MBSR.

Van Dam, N. T., van Vugt, M. K., Vago, D. R., Schmalz, L., Saron, C. D., Olendzki, A. and Fox, K. Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science*. 13 (1) 36 – 61, 2016.

This influential paper addresses some concerns about the rapid spread and overselling of mindfulness, reviewing the present state of mindfulness research, comprehensively summarizing what we do and do not know, while providing a prescriptive agenda for contemplative science, with a particular focus on assessment, mindfulness training, possible adverse effects, and intersection with brain imaging.

Baer, Ruth and Kuyken, Willem. (2014) 'Is mindfulness safe?'

<http://oxfordmindfulness.org/news/is-mindfulness-safe/>

This on-line paper, written in everyday language by two highly regarded mindfulness academics, reviews the evidence on the dangers of mindfulness, concluding that adverse

effects are generally associated with longer silent retreats rather than short MBIs and that as with physical exercise, no potentially beneficial activity is ever risk free. The paper summarizes ways in which risks can be minimized: consideration is given to the intensity of practice, the vulnerabilities of participants, and the qualities of the teacher.

Kabat-Zinn, Jon. *Mindfulness for Beginners: Reclaiming the Present Moment and Your Life*. Sound True, Louisville, CO. 2016.

A deceptively simple book, beautifully written by the originator of secular mindfulness, it presents the key attitudes and practices that the author has found most useful with his students and patients through four decades of practice, in short essay format. Although titled 'for beginners' it actually goes fairly deeply into some key Buddhist principles and concepts. It includes a CD of five guided mindfulness meditations by the author.

Measuring Mindfulness

In the West, growing enthusiasm for mindfulness training has arisen in large part from measurable evidence of its benefits. Although most research focusses on measuring emotional, behavioural or interpersonal outcomes, there have also been attempts to measure mindfulness itself, either as a characteristic intrinsic to an individual or as a skill that can be changed. Numerous self-report mindfulness scales have been developed, coming from different theoretical perspectives, and differing in whether mindfulness is regarded as a one process or a series of related processes. In a major psychometric analysis, Baer et al. 2006 combined all the items from the available mindfulness scales into a single survey and established the underlying factor structure. This resulted in the widely used 39-item Five Facet Mindfulness Questionnaire (FFMQ). Gu et al. 2016 reports on development of a 15-item version of the measure (FFMQ-15) which they found to compare favorably with the longer version. Additional mindfulness scales have appeared since Baer et al. 2006's analysis, and two reviews of these scales, Bergomi et al. 2013 and Park et al. 2013, conclude that they vary widely in the comprehensiveness of their coverage, and that each offers unique advantages and disadvantages. Other interesting developments in the measurement of mindfulness include a scale reported by McCaffrey et al. 2017, that specifically evaluates mindful parenting, and a scale reported by Frank et al. 2016 which measures mindfulness in teachers. The teacher mindfulness scale suggests that that interpersonal mindfulness predicted scores on teacher burnout and teaching efficacy whereas intrapersonal mindfulness failed to predict burnout and efficacy measures. A further

development, the use of breath counting as a behavioural measure of mindfulness, is described by Levinson et al. 2014, which may be a useful adjunct to self-report measures. Although these measures were developed for adults, the literature reports on many that have been used to good effect with older adolescents, and on the development and testing of measures designed specifically for young people. Brown et al. 2011 gives an account of the development of the Mindful Attention Awareness Scale in Adolescents (MAAS-A), Greco 2011 outlines the Child and Adolescent Mindfulness Measure (CAMM), and Johnson et al. 2017 describes the Comprehensive Inventory of Mindfulness Experiences in Adolescents (CHIME-A). Taken together, these scales indicate that it is possible to measure mindfulness and its facets in a quantitative manner, and such measures may be useful for establishing what role different facets of mindfulness play in its beneficial outcomes, including in adolescents.

Baer, R.A., Smith, G.T., Hopkins, J., Krietemeyer, J. and Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13(1), 27-45.

This important study examines the factor structure of published mindfulness measures, specifically the MAAS, KIMS, FMI, CAMS-R, and SMQ. It concludes that mindfulness can be conceived as comprising five clearly differentiated factors: non-reactivity, observing, acting with awareness, describing, and non-judging. It has led to the development of the widely used 39-item Five Facet Mindfulness Questionnaire (FFMQ) which makes it possible to explore the extent to which different facets contribute to the beneficial effects of mindfulness.

Bergomi, C., Tschacher, W. and Kupper, Z.(2013). The assessment of mindfulness with self-report measures: Existing scales and open issues. *Mindfulness*, 4(3), 191-202.

This paper critically reviews the coverage of the eight available mindfulness scales for adults and concludes that each offers unique advantages and disadvantages, but that none seems to provide a comprehensive assessment of all aspects of mindfulness. This has led to the development of the Comprehensive Investigation of Mindfulness Experiences (CHIME), a 36-item survey which measures each of the nine distinct aspects of mindfulness established from their review.

Brown, K.W., West, A.M., Loverich, T.M. and Biegel, G.M. (2011). Assessing adolescent mindfulness: Validation of an adapted Mindful Attention Awareness Scale in adolescent normative and psychiatric populations. *Psychological Assessment*, 23(4), 1023.

Originally developed for adults, the MAAS was designed to measure two cognitive aspects of mindfulness- awareness and attention. This minor adaptation involved removal of one item ('driving on automatic pilot') considered inappropriate for young people, resulting in a 14-item scale. As with adults, a strong single-factor structure was observed for the sample of adolescents aged 14-18, along with good reliability and validity.

Frank, J.L., Jennings, P.A., and Greenberg, M.T. (2016). Validation of the mindfulness in teaching scale. *Mindfulness*, 7, 155-163.

Two independent factors were found to underlie mindfulness scores in teachers – how teachers relate to their personal experience (intrapersonal mindfulness), and how they relate to interactions with students (interpersonal mindfulness). Interpersonal mindfulness predicted scores on measures of teacher burnout and teaching efficacy, whereas intrapersonal mindfulness failed to predict these outcomes. These findings suggest that mindfulness training could be more valuable for teachers if it focusses on relational aspects of experience rather than on the self.

Greco, L.A., Baer, R.A. and Smith, G.T., 2011. Assessing mindfulness in children and adolescents: Development and validation of the Child and Adolescent Mindfulness Measure (CAMM). *Psychological Assessment*, 23(3), 606.

This paper describes the stages in the development of a 10-item mindfulness questionnaire for school-age children. Although the adult literature suggests that mindfulness is a multi-faceted construct with several distinct elements that can be measured separately (e.g. acting with awareness, nonjudging), analysis of the CAMM revealed only a single undifferentiated factor. It is suggested that distinct facets may emerge later in development. Finding a single factor simplifies scoring, since items can be summed to produce a total score.

Gu, J., Strauss, C., Crane, C., Barnhofer, T., Karl, A., Cavanagh, K. and Kuyken, W. (2016). Examining the factor structure of the 39-item and 15-item versions of the Five Facet Mindfulness Questionnaire before and after mindfulness-based cognitive therapy for people with recurrent depression. *Psychological Assessment*, 28, 791.

This is the first study to examine the factor structure of the Five Facet Mindfulness Questionnaire before and after a mindfulness-based intervention. Also compared the standard 39-item questionnaire to an abbreviated 15-item version. Internal consistent and sensitivity to change before and after intervention were adequate for both versions. The

findings suggest that if a short version is needed, the 15-item questionnaire is suitable as an alternative to the longer version.

Johnson, C., Burke, C., Brinkman, S. and Wade, T. (2017). Development and validation of a multifactor mindfulness scale in youth: The Comprehensive Inventory of Mindfulness Experiences–Adolescents (CHIME-A). *Psychological Assessment*, 29(3), 264.

To establish whether the multiple facets of mindfulness observed in adults are relevant to adolescents (aged 12-14), the authors adapted the adult version of the Comprehensive Inventory of Mindfulness Experiences using child-friendly language. Their findings support the use of a 25-item measure of mindfulness encompassing 8 factors: awareness of internal experience; awareness of external experience; acting with awareness; accepting and non-judgmental orientation; decentering and nonreactivity; openness to experience; relativity of thoughts; and insightful understanding.

Levinson, D.B., Stoll, E.L., Kindy, S.D., Merry, H.L. and Davidson, R.J. (2014). A mind you can count on: Validating breath counting as a behavioral measure of mindfulness. *Frontiers in Psychology*, 5, 1202.

This is first study to develop an objective, behavioural measure of mindfulness. The task assessed participants' ability to accurately count their breaths. Actual number of breaths was independently monitored by a physiological device. This breath counting task was found to be reliable, correlated with self-report mindfulness measures and distinct from measures of sustained attention and working memory. Greater accuracy in counting breaths was also associated with more meta-awareness, less mind wandering, and better mood.

McCaffrey, S., Reitman, D., and Black, R. (2017). Mindfulness in parenting questionnaire (MIPQ): Development and validation of a measure of mindful parenting. *Mindfulness*, 8(1), 232-246.

This paper describes the development of a self-report measure of mindful parenting, the 28-item Mindfulness in Parenting Questionnaire (MIPQ). It assesses two dimensions: mindful discipline (non-reactivity in parenting, parenting awareness, and goal-focused parenting) and being in the moment with the child (present centered attention, empathic understanding, and acceptance). Parents with higher scores on either dimension were more likely to show an authoritative parenting style, and less likely to show a permissive or authoritarian parenting style.

Park, T., Reilly-Spong, M. and Gross, C.R. (2013). Mindfulness: a systematic review of instruments to measure an emergent patient-reported outcome (PRO). *Quality of Life Research*, 22(10), 2639-2659.

This useful systematic review of studies employing mindfulness measures compared the measurement quality of ten different mindfulness scales. The scale used by the largest number of studies was the Mindfulness Attention Awareness Scale (MAAS), a brief measure of cognitive aspects of mindfulness, which showed good overall psychometric properties. The Five Facet Mindfulness Questionnaire (FFMQ) had the highest possible ratings on some psychometric properties, although no scale showed superior ratings across all psychometric properties.

Overviews and General Guidance on Mindfulness and Contemplative Education

Mindfulness and contemplative education for children, teens and young adults has experienced an exponential growth in publications, research and programmes in schools and universities. There is now considerable published guidance on the theory and practice of the field, some based on empirical research, some on practical experience. The one comprehensive academic handbook to date by Schonert-Reichl and Roeser 2016, attempts to bring the whole field of mindfulness and contemplative education together in schools and higher education. There is one guidebook on mindfulness in schools and higher education which includes reflection, practice and lived examples from within a Zen based tradition, Nhat Hanh and Weare 2017, as well as one reflective guidebook on mindfulness across the two sectors, Rotne and Rotne 2009, and one reader on contemplative education which also spans both schools and higher education and focuses mainly on theory, Ergas and Todd 2016. Apart from these, there is generally a division between work which is usually called 'mindfulness' in school contexts and 'contemplative' approaches in higher education, although the lines and the terminology often blur. Hawkins 2017, Jennings 2015, Nhat Hanh and Weare 2017, and Ergas and Todd 2016 reflect a strong theme running through much of the guidance literature, which is the essential need for the teacher to practice mindfulness themselves if they are to experience improvements in their own well-being, deepen their abilities as teachers, be effective and credible mindfulness teachers and to create prosocial environments where all may thrive. The guidance outlines the potentially transformative effect of mindfulness on the tasks of teaching, such as deepening the

relationship with students through greater sense of authentic presence and empathy, putting the learner at the heart of teaching and learning, and encouraging students towards self-knowledge. Reviews of the quantitative research on mindfulness for educators by Weare 2012 and Emerson et al. 2017 agree that although this research is in its infancy, the results to date are promising. Both report significant effects from various MBIs across a range of indicators of well-being and mental and physical health particularly in relation to stress. There is also a growing awareness of the importance of school ecology and ethos. Rotne and Rotne 2009 discusses the importance of creating environments that foster stillness, calm, kindness, connectedness, compassion and warmth. There is discussion of the ways in which mindfulness might contribute to a rethinking of the core purpose and mission of education for the 21st century, rediscovering more holistic approaches and a sense of ethical purpose, expressed for example in the suggestion in Nhat Hanh and Weare 2017 that education might enable learners to focus on the joy of the present moment, not just on the need to strive for future oriented success.

Schonert-Reichl, Kimberly A., and Roeser, Robert W (eds). *Handbook of Mindfulness in Education: Integrating Theory and Research Into Practice*. New York: Springer, 2016.

This substantial reader is the first attempt at providing a comprehensive and authoritative summary of a wide range of work on mindfulness and contemplative approaches, set mainly in the United States. Edited by two leading lights who are also authors, and with 22 papers written by other leaders of the field, it summarises the state of the science and describes current and emerging applications and challenges, integrating history, theory, philosophy, research, practice, and policy.

Ergas. Oren and Todd, Sharon. *Philosophy East/West: Exploring Intersections Between Educational and Contemplative Practices*. Chichester: Blackwell/John Wiley, 2016

This book is rewarding and thought provoking with a philosophical slant. It examines the intersection of mindfulness, and evidence-based science to explore the complexity and diversity of various wisdom traditions, investigating the effect of mindfulness-based curricular interventions on current educational theory and practice. It uses insights from Western philosophers including Heidegger, Levinas, and Foucault to situate contemplative practice within contemporary educational theory. It emphasizes the importance of transcultural and intercultural approaches in the philosophy of education

Nhat Hanh, Thich, and Weare, Katherine. *Happy Teachers Change the World: A guide to cultivating mindfulness in education*. San Francisco: Parallax, 2017.

This is the first guidebook to the influential teaching of world respected Zen master and seminal writer and practitioner on mindfulness, Thich Nhat Hanh. It synthesizes his teachings with instructions for core practices from the Plum Village tradition, educational guidance on how to apply these practices of mindfulness, kindness and compassion in one's own life, and in classrooms, schools and universities, illustrated with first hand examples from the practice of teachers from around the world.

Rotne, Kikolaj and Rotne, Dikke Flor. *Everybody Present*. Berkley: Parallax. 2009.

This reflective 'working manual' by Danish educators reframes the culture of education and student-teacher relationship, illustrating the transformative effects of mindfulness on educators, students, and their classrooms. With stories, exercises, and case studies it suggests that mindfulness can help to strengthen inner peace and prevent stress, foster contagious joy and an ethic of altruism, and improve understanding and relationships.

Hawkins, Kevin. *Mindful Teacher, Mindful School*. Sage, London. 2017.

Written by an ex head teacher and one time director of the international arm of the UK Mindfulness in Schools project, this very accessible book provides practical guidance on how to implement mindfulness across the stressful and busy lives of teachers and the entirety of the school, as well as into classroom teaching. Anecdotes taken from work in many countries give it plenty of colour.

Jennings, Patricia, *Mindfulness for Teachers: Simple Skills for Peace and Productivity in the Classroom*. New York: Norton. 2015

This US guidebook is written by a mindfulness expert who combines an academic base and solid research experience in neuroscience, psychology, and education with applied mindfulness teaching and programme development. The book focuses mainly on the teacher's own mindfulness, suggesting the principles for managing classroom stresses, cultivating the learning environment and applying mindfulness in classrooms.

Brown, Valerie and Olson, Kirsten. *The Mindful School Leader*. Thousand Oaks, CA: Sage 2015

The only book to date aimed at school leaders and written by two leading US school leadership trainers, this handbook outlines techniques for adding mindfulness into daily school life, including managing meetings and responding creatively to complex situations. It includes profiles of real life mindful school leaders and a guide to resources including apps.

Schoeberlein David, Deborah and Seth, Suki. *Mindful Teaching and Teaching Mindfulness: A Guide for Anyone Who Teaches Anything*. Somerville Massachusetts: Wisdom Publications, 2009.

This very practical, straightforward and easy to read book, aimed at 'teachers' of all kinds, including parents and coaches, follows a school teacher through their day, focusing on how to teachers can tune into what's happening, inside and around them to plant the seed for an education infused with attention, awareness, kindness, empathy, compassion, and gratitude.

Weare, Katherine *Evidence for Mindfulness: Impacts on the Wellbeing and Performance of School Staff*. 2012. <https://mindfulnessinschools.org/wp-content/uploads/2014/10/Evidence-for-Mindfulness-Impact-on-school-staff.pdf>

A narrative review of 13 studies summarises the apparent impacts of mindfulness on wide range of indicators of mental and physical health in school staff, including stress, well-being and life satisfaction, kindness and compassion to self and others, attunement to students' needs, personal effectiveness, cognitive performance, and job performance.

Emerson, L-M, Leyland, A, Hudson, K et al. (3 more authors) (2017) *Teaching Mindfulness to Teachers: A Systematic Review and Narrative Synthesis*. *Mindfulness*, 8 (5). pp. 1136-1149. ISSN 1868-8527

The first systematic review on this topic, based on 13 studies. As would be expected in a new area, MBIs did not shown uniform results, but significant impacts were shown across the studies on anxiety and depression, burnout, stress, physical symptoms, sleep, time pressure, sense of accomplishment and satisfaction with life. The authors hypothesized that improved emotion regulation lay behind these shifts.

Guidance on Teaching Mindfulness in Classrooms

In addition to reflective literature that focuses on principles and examples, some of which contain outlines of curricula, there is a growing literature of more practically based detailed curriculum-based guidance on teaching mindfulness in classrooms in schools and universities.

This literature generally emphasizes the central importance of the teacher developing their own practice first before moving on to teaching others. In three well respected and practical guidance, Olson and Kosolino 2014 focuses on classrooms and classroom climates, Willard and Saltzman 2015 on children and adolescents, and Kaiser Greenland 2013 on younger children. All three briefly outline some theory and evidence of then move on to outline curricula and implementation strategies, with examples and case studies, drawing on the authors' experience. The practical guidance generally reflects a variety of activities, methods and materials, as appropriate to the particular age group, but the 'common core curriculum' from adult MBSR/MBCT tends to form the skeleton, most typically breath awareness and present moment awareness (watching thoughts, feelings, sounds and bodily sensations come and go), often adding practices on mindful movement, mindful eating, relaxation, body scan/body awareness, and more rarely compassion based practice. The literature is generally strictly secular, but two popular guides/manuals, Nhat Hanh 2006 and Srinivasan 2009, come overtly from a Zen Buddhist tradition. Some taught programmes are not available to purchase and make their materials and guidance available only to those who undergo training, but many produce manuals that are commercially published. Two of these come from programmes with some evidence behind them, including Broderick 2013 and *MindUP*. There are also some useful self-help books for teens, including Vo 2015 written by a pediatrician who works with teens, and Beigel 2017, written by the author of the 'Stressed Teens' programme which has been subject to an RCT, published in Biegel et al. 2009.

Olsen, Kirke and Cozolino, Louis. *The Invisible Classroom: Relationships, Neuroscience and Mindfulness in School*. New York: Norton, 2014.

A thoughtful synthesis of brain science, mindfulness, and positive psychology, based on the premise that all classroom interactions have "invisible" neurobiological, emotional, and social aspects, including the emotional histories of students, and the teacher's own background and biography, which the teacher needs to grasp to understand the full range of their students' school experiences. It includes classroom-ready resources to help practitioners turn these insights into practice.

Willard, Christopher, and Saltzman, Amy. *Teaching Mindfulness Skills to Kids and Teens*. New York: the Guildford Press, 2015.

Starting with a succinct chapter on well documented current research findings, the main thrust of this book is practical. It aims to impart creative, effective ideas for bringing

mindfulness into the classroom, child therapy office, and community. It features sample lesson plans and scripts, case studies, and vignettes, and explores strategies for overcoming obstacles, engaging the young and integrating mindfulness into broad range of activities.

Kaiser Greenland, Susan. *The Mindful Child*. New York: Atrea/Simon and Schuster, 2013.

This highly influential book is written for educators and parents by the founder of the positively evaluated *Inner Kids* programme is based on her extensive experience of teaching mindfulness to children, including cultivating kindness and compassion. It has an accessible, homely style and is particularly strong on practical tips, caveats and examples from life. It is mainly focused on younger age groups.

Srinivasan, Meena. *Teach, Breathe, Learn: Mindfulness in and out of the Classroom*. Berkley, California: Parallax, 2009.

A highly practical book, written by a classroom teacher and based on her own experience, inspired by a range of influences, most evidently the work of Thich Nhat Hanh and Plum Village. Part one focuses on the teacher's own mindfulness, part two offers techniques for cultivating loving-kindness, gratitude and empathy, and part three introduces a curriculum that teachers can use to incorporate mindfulness into their classroom, with lesson plans, handouts, and homework assignments.

Nhat Hanh, Thich. *Planting Seeds*. Berkley: Parallax, 2009.

Based on Thich Nhat Hanh's thirty years of practical experience teaching mindfulness and compassion to parents, teachers, and children, the book and CD offer insight, concrete activities, and curricula that parents and educators can apply in school settings, in their local communities or at home in working with children, aged from 5-11. The CD has recordings of all the songs in the book as well instructions for meditations, and the book is pleasantly and simply illustrated.

Broderick, Patricia C. *Learning to Breathe: A Mindfulness Curriculum for Adolescents to Cultivate Emotional Regulation, Attention and Performance*. Oakland: New Harbinger, 2013.

The comprehensive and clear manual for the evaluated '*Learning to Breathe*' curriculum. It begins with a succinct account of the research base for mindfulness and the wider work of SEL and is thereafter a step by step guide to teaching the curriculum in the classroom. It focuses on aspects of mindfulness that are most obviously of interest to mainstream

educators, including stress, emotional regulation, attention and performance, and then moves on to include work on reflecting on learning, the body and loving kindness.

Scholastic Inc. *MindUP : Brain-Focused Strategies for Learning--And Living*. New York: Scholastic. 2014

There are 3 manuals for this very popular 'MindUP' curriculum, for kindergarten to year 2, years 3 to 5 and years 6 to 8 which has been evaluated and found to be effective in many domains. It combines elements of mindfulness, social and emotional learning and neuroscience at a level appropriate for the students in an attractive and tried and tested format.

Vo, Dzong X. *The Mindful Teen: Powerful Skills to Help You Handle Stress One Moment at a Time*. Oakland: New Harbinger, Instant Help Books, 2015

This self-help book is written by an experienced pediatrician who works extensively with teens and who has developed his own taught programme based on based on tried and tested MBSR/MBCT, plus some elements of the work of Thich Nhat Hanh. It talks directly to young people in a simple and practice style, to help them understand and apply practical strategies to deal with stress mindfully, including the pressures of school such as tests and examinations, and improve relationships with family and friends.

Biegel, Gina. *Stress Reduction Workbook for Teens, 2nd Edition: Mindfulness Skills to Help You Deal with Stress (An Instant Help Book for Teens)* Barnes and Noble. Peabody Massachusetts, 2017.

The most recent version of the self-help manual for teens which has emerged from the evaluated *Stressed Teens* programme. It focuses on the everyday pressures issues that are felt by teenagers themselves to explore the mindfulness skills that can reduce this stress using simple workbook activities to build on the resources, skills, and positive qualities that teenagers already possess.

Biegel, G.M., Brown, K.W. Shapiro, S.L., and Schubert, C.M. (2009). 'Mindfulness-based Stress Reduction for the treatment of adolescent psychiatric outpatients: a randomized clinical trial'. *Journal of Consulting and Clinical Psychology*, 77(5): 855-866.

One of the first RCTs, an evaluation of the *Stressed Teens* programme, an MBSR based intervention with 102 adolescents aged 14-18 with a range of diagnoses in an outpatient

psychiatric facility. The intervention group reported significantly reduced anxiety, depressive symptoms, obsessive symptoms, somatization symptoms, stress and interpersonal problems, with improved self-esteem and sleep quality, relative to those who did not receive the intervention, and they still showed improvement 5 months later.

Contemplative Education

Within higher education, and particularly in the US, there is a growing trend for mindfulness meditation to be framed within so called 'contemplative education'. Contemplative education is a slightly wider approach than mindfulness and tends to be more integrated into the core business of teaching and learning in classrooms, although MBIs aiming to reduce stress and depression are also found in higher education contexts. ***The Journal of Contemplative Inquiry*** is core to the creation and dissemination of theory and practice in the field. Contemplative education is a field based in philosophical and educative reflection, theory and practice rather than in the world of therapeutic interventions that inspired secular mindfulness and MBIs. It is therefore not the kind of work that is easily going to become an 'intervention' and subject to controlled research but it nevertheless interfaces well with the MBI approach, and is slowly making its mark on higher education. It is grounded in a wide range of wisdom traditions, including not only Buddhism but also traditions such as Taoism, Sufism, Christianity and Judaism. It aims to integrate introspection and experiential learning into academic study, to support both academic and social engagement, the development of self-understanding, analytical and critical capacities, the skills for engaging constructively with others, and a sense of engagement, connectedness, purpose and meaning. It is generally inspired by a critique of higher education as having lost sight of these broader and deeper aims in favour of a more shallow and instrumental view of education as learning of facts and preparation for the current workplace. The field is summed up succinctly in a chapter by one of its founding fathers and leading lights, Zagonc 2016. There is a growing literature on both the practice and the impact of contemplative approaches which focuses largely on their applications to teaching and learning, expressed most expertly in recent books by some of the leaders in the field, Barbezat and Bush 2014 and Ergas 2017. These two books include curricula and descriptions of taught programmes and exercises, using qualitative data and firsthand accounts to outline shifts in the reported experience of students. Rogers and Maytan 2012 and Huston 2015 are two sets of guidance which outline helpful practical reflections and advice from teachers based within individual universities and colleges. Rogers 2017 has further supported this literature aimed at teachers with a self-help manual for students. Such initiatives are usually focused within a particular

university and led by committed individual staff or sometimes a team, rather than the overarching evaluated programmes that are more common in the school system. Impacts of contemplative approaches on learning are explored in * Developing cognition - executive function, learning, attainment, reflection, wisdom*.

The Journal of Contemplative Inquiry (ISSN: 2333-7281),

Founded by the Center for Contemplative Mind in Society, this is the main peer-reviewed journal for publishing articles, reflections, and reviews to support the scholarly exchange of ideas and useful information regarding the understanding, development, and application of contemplative and introspective methods in all aspects of higher education. It aims to build bridges with teaching and learning, student life, faculty development, leadership studies, and related areas, with an emphasis on compassion and social justice.

Zagone, Arthur "Contemplation in education". In Schonert-Reichl, Kimberly A and Roeser, Robert W (eds). *Handbook of Mindfulness in Education: Integrating Theory and Research Into Practice*. New York: Springer, 2016. Pp 17-28.

An opening chapter in the definitive reader on mindfulness and contemplation in education authored by the first director of the Center for Contemplative Mind in Society, who pioneered the application of contemplative practices within higher education. It gives a succinct and comprehensive account of the whole area, sketching its origins in both western and the eastern wisdom traditions/philosophy, explores its meaning, its place within higher education, and its principles and core practices.

Barbezat, Daniel P, and Bush, Mirabi. *Contemplative Practices in Higher Education: Powerful Methods to Transform Teaching and Learning*. New York: Wiley/Johns & Bussey, 2014.

A theoretically and practically based overview written by two groundbreakers in this field. A chapter on the evidence base draws on work with adults as well as students to explore impacts on cognition, well-being, self-understanding, compassion and connection, and later chapters explore theory, principles and debates within the field, including advice on how teachers might develop their own practice, and provide examples of a range of contemplative applications and their relationship to learning across many domains and disciplines.

Owen-Smith, Patricia. *The Contemplative Mind in the Scholarship of Teaching and Learning* Bloomington Indiana: Indiana University Press. 2018

The author teaches at Emory University and reflects here on how contemplative practices may find a place in higher education. She offers classroom models illustrated with her own teaching experience and connects contemplative practices with mainstream teaching and learning, aiming to bring awareness of the contemplative pedagogy to a wider audience, while outlining the ongoing challenges of both defining these practices and assessing their impact in education.

Huston, Dan. *Communicating Mindfully: Mindfulness-Based Communication and Emotional Intelligence. 6th Edition.* Cleveland Ohio: August Learning Solutions. 2015.

The author teaches communication at Concord's Community College and has applied his own enthusiasm for mindfulness mediation to communication theory and thus to his teaching to his regular classes. This publication is the 6th edition of the accompanying well-structured and accessible course textbook, with plenty of examples, exercises and -unusually - photographs. It encourages students to use mindfulness to deepen their awareness bring themselves to the reality of the present moment in their communications with themselves and others.

Ergas, Oren. *Reconstructing 'Education' through Mindful Attention: Positioning the Mind at the Center of Curriculum and Pedagogy.* London: Palgrave/McMillan, 2017.

Fusing together philosophy, neuroscience and psychology, this profound and thought-provoking book outlines a person centred approach on 'educational' theory, practice and research in which the mind of the learner, rather than the vision of the educator, is core.

Rogers, Holly and Maytan, Margaret. *Mindfulness for the Next Generation: Helping Emerging Adults Manage Stress and Lead Healthier Lives.* Oxford: Oxford University Press. 2012.

This easy-to-follow guide is written by the creators of *Koru Mindfulness* programme at Duke University in the US which has been subject to some evaluation. It contains plans with practical instructions broken down into four sessions for teachers, therapists, and student service providers to follow, with the aim of helping young adults navigate this stressful and unique developmental time in their lives.

Rogers, Holly. (2017) *The Mindful Twenty-Something: Life Skills to Handle Stress...and Everything Else.* Barnes and Noble. Peabody Massachusetts

This self-help manual is also based *Koru Mindfulness* program, developed at Duke University. It aims to help 'emerging adults' (aged 18- 29) to face developmental challenges with less stress and greater calmness, balance and ease.

Reviews of the Quantitative Evidence Base for Mindfulness with School Aged Youth

The type of work which is generally cited as the 'evidence base' underpinning mindfulness in education focuses almost entirely on MBIs, because their well-defined offerings are easier to evaluate using western scientific and experimental methods. The number of studies of MBIs has been growing steadily and in the last decade has been sufficient to allow for literature reviews of various kinds. Some, such as Miekejohn et al. 2012, are examples of a 'narrative review', which can provide a useful overview of the field, despite the selection processes, assessments and conclusions being subjective. In contrast, systematic reviews, such as Felver et al. 2015, collect all the empirical evidence that answers a pre-defined research question, which is analysed using a transparent and structured methodology. Once the field is large enough to allow for numerical calculations, systematic reviews are often combined with meta-analyses, which bring together the quantitative findings of a range of studies and make a pooled statistical estimate of the overall impact on various outcomes. Most policy makers now look to meta-analyses for their guidance, and there are several recent good quality meta-analyses in the field. These include Zenner et al. 2014, Zoogman et al. 2014, Kallapiran et al. 2015, Maynard et al. 2017 and Klingbeil 2017. A review of reviews by Weare 2018 concludes that despite the inevitable minor differences in the conduct of the reviews, there is remarkable consensus amongst them and they come to cautiously positive conclusions, identifying effects in the small to medium range across a wide variety of outcomes. All have concluded that mindfulness is popular with staff and children/young people (so called 'acceptable') when taught as intended i.e. by experienced teachers, who are embedded within the institution, and with their own mindfulness practice. They find little evidence of harmful (so called 'adverse') effects. They tend to use a similar format and repeated themes and activities: MBIs generally take the form of a series of lessons, typically delivered in sessions running between 6 and 10 weeks, in which students are offered mindfulness practices, with short meditations focusing on breath, body, sound, movement and eating, supported by discussion and class exercises. Several MBIs have been integrated with other components, most often yoga and/or social and emotional learning (SEL) in school.

Research on the impact of MBIs is most often reported from the US or Canada but there are examples from Australia, Europe (including the UK) and Asia. There appear to be as yet no systematic reviews of MBIs in higher education, only theoretically-based work and impressionistic summaries, see *Contemplative Education*.

Meiklejohn, J., Phillips, C., Freedman, M. L., Griffin, M. L., Biegel, G., Roach, A., . . . Soloway, G. (2012). 'Integrating mindfulness training into K-12 education: Fostering the resilience of teachers and students'. *Mindfulness*. 3 (4): 291-307, (2012)

This narrative review reports on 3 teacher training initiatives which suggest that mindfulness can increase teachers' sense of well-being, teaching self-efficacy, and ability to manage classroom behavior and supportive relationships with students, and at 14 studies of programs for which have collectively demonstrated a range of cognitive, social, and psychological benefits to both elementary (6 studies) and high school (8 studies) students.

Zenner, C., Herrnleben-Kurz, S., and Walach, H. Mindfulness-based interventions in schools—a systematic review and meta-analysis. *Frontiers in Psychology*. 5:603: 1-20. doi: 10.3389/fpsyg.2014.00603. 2014.

This is a solid systematic review of MBIs in schools, enhanced by the inclusion of a meta-analysis of 24 MBIs, exploring a wide range of psycho-social and cognitive domains. It found a significant medium effect size across all controlled studies, with strongest effects in the domain of cognitive performance.

Felver, J. C., Doerner, E., Jones, J., Kaye, N. C. and Merrell, K. W. Mindfulness in school psychology: Applications for intervention and professional practice; *Psychology in Schools*, 50: 531–547. doi:10.1002/pits.21695, 2015.

A solid systematic review of studies in school settings, with a helpful commentary on the field. It concluded from 28 studies, including 10 RCTs, that MBIs can be effective at reducing "psychosocial problems and supporting positive attributes" (in which they included mental health indicators, social and emotional learning, cognitive function and physiological measures).

Zoogman, S., Goldberg, S. B., Hoyt, W. T. and Miller, L. Mindfulness interventions with youth: A meta-analysis. *Mindfulness*, 6(2), 290-302, 2014.

A meta-analysis of mindfulness interventions with youth aged 6–21 years (including non-school settings) identified 20 studies that met its criteria. It found MBIs showed effect sizes in the small to moderate range for all outcomes, including emotion and behavioral regulation, depressive and anxiety symptoms, stress, attention, and cognitive functioning.

Kallapiran, K., Koo, S., Kirubakaran, R., and Hancock, K. Effectiveness of mindfulness in improving mental health symptoms of children and adolescents: A meta-analysis. *Child and Adolescent Mental Health*, 20: 182–194. <http://dx.doi.org/10.1111/camh.12113>. Kallapiran et al. 2015.

A meta-analysis which analysed 11 RCTs which targeted mental health outcomes in both clinical and non-clinical samples of young people ranging from 6 to 18 years old. It concluded that MBIs with non-clinical samples (including schools) had small effects on stress and depression, and large effects on anxiety.

Maynard, B.R., Solis, M.R., Miller, V.L., and Brendel, K. E. *Mindfulness-based Interventions for Improving Cognition, Academic Achievement, Behaviour, and Socio-emotional functioning of Primary and Secondary School Students*. Campbell Systematic Reviews:5. DOI: 10.4073/csr2017.5. 2017.

An influential systematic review and meta-analysis of MBIs for school aged children in a range of settings, which identified 61 studies for systematic review, and 35 randomized or quasi-experimental studies for further meta-analysis. It found small positive effects on cognitive and socioemotional outcomes, and positive but non-significant effects on academic and behavioral outcomes. The authors did not find enough studies for to estimate the size of impacts on physiological measures of health.

Klingbeil, D.A., Renshaw, T.L., Willenbrink, J.B., Copek, R.A., Chan, K., Haddock, and Clifton, J. Mindfulness-based interventions with youth: A comprehensive meta-analysis of group design studies. *Journal of School Psychology*. 63: 77-103. 2017a.

A meta-analysis of 76 studies in a range of youth related settings. It concluded that MBIs yield a small positive average treatment effect across all outcomes, with the largest effect being seen academic achievement and school functioning, and slightly lower but still positive effects on meta-cognition, attention, cognitive flexibility, emotional/behavioral regulation, mental health issues/ internalizing problems (e.g. distress, depression and anxiety), positive

emotions and self-appraisal. It reported larger effect sizes at follow up than immediately after interventions.

Weare Katherine **The Evidence for Mindfulness in Schools for Children and Young People*[<https://mindfulnessinschools.org/wp-content/uploads/2018/04/Weare-Evidence-Review-Final.pdf> 2018]*.

This review of reviews, published free on line, is regularly updated and attempts to synthesize the results all existent good quality reviews. It concludes that MBIs in school settings are popular, show little evidence of adverse effects, can reliably impact on a wide range of indicators of positive psychological, social and physical well-being and flourishing in children and young people and on aspects of cognition, and show promising preliminary evidence for impacts on grades, behaviour, and physical health.

The Impacts of Mindfulness on the Young

This section explores in more detail literature which explores the impacts of mindfulness in schools and higher education. The best known and most often cited is generally published across a wide range of academic journals. For ease of reading what follows is divided into types of outcome but in practice most mindfulness and contemplative based interventions aim to influence a range of psycho-social, cognitive and behavioral outcomes, so the category in which individual sources have been placed is something of an artificial creation, based where the work cited places most of its emphasis and/or has had most influence.

Psycho-Social Well-being

Definition and Origins of Mindfulness explored both the origins of mindfulness in wisdom traditions as part of the effort to reduce human the suffering caused by the reactive mind. Research on mindfulness with adults has particularly focused on its ability to influence psychological and social aspects of well-being, and on aspects of mental health such as depression, anxiety and stress. The link hypothesized is the ability of mindfulness to reduce negative rumination and worry, to increase insight into how the mind works, and the ability to accept aspects of current reality that cannot be changed. Work with young people has generally continued the focus on psycho-social well-being, and it is the main area which the majority of MBIs in educational contexts, and almost all the reviews, have concentrated and measured. The evidence comes from a growing number of studies, although the field is still relatively small with around 30 studies showing up regularly across reviews. The subset of work on MBIs within

higher education has focused mainly on student stress, and often conducted with medical and nursing students. Semple et al. 2011 explores mindfulness for anxious children and is to date the sole research-based manual on mental health and mindfulness in children: other than the literature is generally to be found in journals. Bernay et al. 2016 is a rare example of an evaluation of an intervention that focuses entirely on positive well-being, More typically it is mental health problems that are the main focus of interest: Kuyken et al. 2015 is a relatively large and very influential study which focuses on depression, stress and anxiety as well as on well-being. Sibinga et al. 2016 looks the impact of mindfulness on a wide range of mental health problems in a deprived area, while Raes et al. 2014 focuses on depression in 13-20-year olds and Galante 2017 and Warnecke 2011 both explore the impact on stress in medical students. These papers, and others which form the empirical research base, show clear consensus that well conducted MBIs can impact positively on psychological, mental and social health and well-being of the young, and that there is reliably between a small and medium impact of MBIs in educational settings on mental health, including positive well-being and the prevention of depression, anxiety and stress.

Semple, Randye J., and Lee, Jennifer. *Mindfulness-Based Cognitive Therapy for Anxious Children: A Manual for Treating Childhood Anxiety*. Oakland: New Harbinger. 2011.

To date the sole research-based textbook on mental health and mindfulness in children, this is an outline of a 12-session guide by two of the key experts in the field, aimed at professionals, to help children aged 9-12 manage anxiety, using in group or individual therapy and involving parents. It contains poems, stories, session summaries, and home practice activities supported by a CD-ROM and covers mindful awareness concepts and practices, such as relating more spaciously to anxious thoughts and feelings.

Bernay, R. Graham, E. Devcich, D.D. Rix, G. and Rubie-Davies, C.M. 'Pause, breathe, smile: a mixed-methods study of student wellbeing following participation in an eight-week, locally developed mindfulness program in three New Zealand schools', *Advances in School Mental Health Promotion*, DOI:10.1080/1754730X.2016.1154474 2016.

The design of this study is before and after, so not as strong as many of the other studies which have a control group, but it is a rare example of an intervention that focuses entirely on positive well-being. 124 elementary students studied an eight-lesson module, tailored to fit with attitudes to health and well-being held by the indigenous Māori population in New Zealand. Practices

included the cultivation of kindness and gratitude, emotion-regulation and a sense of interconnectedness with the wider environment. The study found significant improvements in subjective well-being, cheerfulness and satisfying interpersonal relationships.

Kuyken, Willem, Weare, Katherine, Ukoumunne, Obi., Vicary, Rachel., Motton, Nicola., Burnett, Richard., and Huppert, Felicia. 'Effectiveness of the mindfulness in schools programme: Non-randomised controlled feasibility study. *The British Journal of Psychiatry*, 203(2): 126–131. 2015.

A relatively large and very influential study, with non-randomised controls, of a 9 week version of the .b (pronounced 'dot be') Mindfulness in Schools programme, with 522 adolescents aged twelve to sixteen across 12 schools and 9 teachers. The intervention group reported significantly fewer depressive symptoms post-treatment and at three-month follow-up, and lower stress and greater well-being at follow-up, compared with controls. Greater home practice was significantly associated with better outcomes, such as greater well-being and less stress at 3 months follow-up.

Sibinga E.M, Webb, L., Ghazarian, S.R. et al. School-based mindfulness instruction: An RCT. *Pediatrics*.;137(1): e20152532 (2016).

Mindfulness is sometimes accused of being a middle-class preoccupation, but a fairly large and robust RCT compared a 12-week MBI with a health education class, using a sample of 300 students aged between 9 and 12 in schools from a deprived area. MBI students showed significantly lower levels of mental health problems, including somatization, depression, and posttraumatic symptoms, and exhibited lower rates of negative coping, rumination, and self-hostility, compared with controls.

Raes, P.Griffith, J. W., Van der Gucht, K., and Williams, J. M. G. (2014). 'School-based prevention and reduction of depression in adolescents: A cluster-randomized controlled trial of a mindfulness group program'. *Mindfulness*, 5, 477–486.

An account of a sizeable RCT of a universal MBI, with 12 pairs of parallel classes, with 408 secondary school students, aged 13- 20 from five schools. It found a medium sized effect on depressive symptoms.

Galante J, Dufour G, Vainre M, et al. A mindfulness-based intervention to increase resilience to stress in university students (the Mindfulness Student Study): a pragmatic randomised

controlled trial. *Lancet Public Health*, published online Dec 18 2017.

[http://dx.doi.org/10.1016/S2468-2667\(17\)30231-1](http://dx.doi.org/10.1016/S2468-2667(17)30231-1)

A well conducted and sizeable RCT of an 8-week MBI for students at the University of Cambridge, UK. The MBI reduced distress scores during the examination period: 214 in the control group had distress scores above an accepted clinical threshold level compared with 88 (37%) of the 235 MBI group, a moderate effect size. Distress in the control group worsened over the year, whereas the MBI group improved after the course, an effect maintained during examinations.

Warnecke, Emma, Stephen Quinn, Kathryn Ogden, Nick Towle, and Mark R. Nelson. "A randomised controlled trial of the effects of mindfulness practice on medical student stress levels." *Medical Education* 45, no. 4 (2011): 381-388.

An RCT of an 8-week MBI at three medical schools in Tasmania involving 66 medical students in their final 2 years of study, who were simply asked to engage in CD led practice. It showed significant reductions in perceived stress and anxiety maintained 8 weeks later.

Social and Emotional Learning, Self-Regulation, and Compassion

The wisdom traditions from which mindfulness originates see it as but one component of a connected and relational way of life involving respect, friendliness and kindness towards other people, underpinned by self-knowledge and self-control, and adherence to a solid ethical system based on altruism, compassion and social responsibility. Translated into modern western educational language this is the territory of social and emotional learning (SEL), within which we find terms such as self/emotion regulation, resilience, empathy and values. Schonert-Reichel and Lawlor 2010 and Schonert-Reichel, et al. 2015 describe the evaluations of a classroom project with wide global reach, *MindUp*, which integrates mindfulness and SEL. The RCTs on which they report suggest it impacts on many aspects of social and emotional competence. Self-regulation is particularly key to mindfulness, to SEL, to education, and indeed to human flourishing. The term refers to the ability to monitor and control thoughts, behaviours/actions and emotions, which have been found to be predictive of a wide range of outcomes around student well-being, such as stress, anxiety and depression, classroom behaviours and disciplinary incidents, and to school grades and performance. Self-regulation is generally divided into emotion self-regulation (affect, behaviour and mental health) and cognitive self-regulation (executive function, attention, and planning) - the latter is explored in *Developing Cognition - Executive Function, Learning, Attainment, Reflection, Wisdom*. Emotion self-

regulation refers to the ability to control emotional impulses and delay gratification. Metz et al. 2013 suggests that mindfulness impacts on many aspects of self-regulation and emotional regulation, with Viafora et al. 2015 noting its impact on acceptance, Broderick and Metz 2009 exploring its impact on the ability to relax, Schonert Reichel et al. 2015 and Schonert-Reichl and Lawlor 2010 uncovering an impact on optimism, and Lau and Hue 2011 noting an impact on students sense of autonomy, mastery and growth. Mindfulness-based compassion is a rapidly developing field with adults, and there is a parallel movement in education. It is well known within education that the ability to make relationships is a protective factor for well-being and mental health: having friends, feeling accepted and connected enables young people to feel safe, confident, and ready to work and learn effectively. The basic practice of mindfulness itself and the core skills it cultivates, particularly the fundamental attitudes of open hearted curiosity and kindness, have the potential to generalise into a wider sense of compassion and empathy to the self and others. Some MBIs are focusing on teaching compassion more explicitly: Broderick and Metz 2009, Schonert-Reichel et al. 2015, Sibiinga 2016, Black and Fernando, 2013, and Flook 2015 all evaluate MBIs which include an explicit element on caring and compassion, which appears to impact on relationship skills, empathy, self-compassion and self-care.

Schonert-Reichl, K. A., and Lawlor, M. S. (2010). 'The effects of a mindfulness-based education program on pre-and early adolescents' well-being and social and emotional competence'.

Mindfulness, 1(3): 137–151.

A control trial assessed the impact of *MindUP* on 246 fourth- to seventh-grade children, drawn from 12 classrooms in elementary schools in Vancouver, Canada. Students showed significant improvements on a wide range of (teacher-rated) aspects of social and emotional learning, such as aggression, behavioural dysregulation, and social competence, as well as greater self-reported optimism and mindful attention, compared with controls.

Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F. and Diamond, A. (2015). 'Enhancing cognitive and social–emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial'. *Developmental Psychology*, 51(1): 52–66.

Ninety-nine fourth- and fifth-grade classrooms were randomly assigned to receive a 12-week version of the *MindUP* program or attend an active control. The MindUP group showed significant increases in optimism, emotional control, empathy, sharing, trustworthiness,

helpfulness, perspective taking, and prosocial goals and significant decreases in aggressive behaviour and decreased depressive symptoms, compared with the control group, who demonstrated significant deterioration in these measures.

Metz, S. M., Frank, J. L., Reibel, D., Cantrell, T., Sanders, R., and Broderick, P. C. (2013). 'The effectiveness of the learning to breathe program on adolescent emotion regulation'. *Research in Human Development*, 10(3): 252–272.

A larger controlled study of *Learning to Breathe*, 216 high school students in a choir class, found that students who participated in the programme reported statistically lower levels of perceived stress and psychosomatic complaints, higher emotional regulation, including emotional awareness, greater access to emotional regulation strategies, and greater emotional clarity, compared with controls.

Black, D. S., and Fernando, R. (2013). 'Mindfulness training and classroom behaviour among lower-income and ethnic minority elementary school children'. *Journal of Child and Family Studies*, 23(7), 1242–1246. <http://doi.org/10.1007/s10826-013-9784-4>

A pre-post study of a 5-week MBI with 409 kindergarten to 6th grade students, evaluated by teacher report, showed improved classroom behaviour and the ability to pay show care and respect for others: the effects were apparent up to 7 weeks after the intervention.

Flook, L., Goldberg, S. B., Pinger, L., and Davidson, R. J. (2015). 'Promoting prosocial behaviour and self-regulatory skills in preschool children through a mindfulness-based kindness curriculum'. *Developmental Psychology*, 51(1): 44–51.

The Kindness Curriculum is a 12-week mindfulness programme for preschool-age children which includes kindness practices such as empathy, gratitude, and sharing. An RCT with 68 children found the intervention group showed greater improvements in social competence and cognitive functioning, and higher grades for health and social-emotional development, compared with the control group. Meanwhile the control group exhibited more selfish behavior over time. Children who had initially lower grades in social competence exhibited larger shifts.

Addressing 'Problem Behaviour'

Schools are generally very interested in interventions that might help improve so called 'difficult' behaviour. It is reasonable to hypothesise that the impact of MBIs on sociability, empathy, self-

regulation and emotional regulation explored in *Social and Emotional Learning, Self-Regulation, and Compassion*, might lead to visible and demonstrable improvements in behaviour classed as 'difficult', and some MBIs have attempted to measure such impacts on behaviour. The reviews and meta-analyses explored in *Reviews of the Quantitative Evidence Base for Mindfulness with School Aged Youth*, differed in how confident they were that MBIs impact on 'problem behaviour' and there is still not a great deal of research in this area. However, some evidence that might be cautiously described as promising is starting to emerge in both mainstream school, in special education, and in and out of school settings such as homes, clinics, and detention centres. 'Difficult' behaviour impacts on mainstream young people, disrupting normal classroom activities: Schonert-Reichl, et al. 2015 reports that the *MindUP* programme helped mainstream students become more sociable and less aggressive. Behaviour problems can be a particular issue with young people with special needs, most obviously ADHD, and Zylowska et al. 2007 and Haydicky et al. 2012 both report improvements in students with ADHD symptoms and attention. Beauchemin et al. 2008 notes improvements in the behaviour of students diagnosed with learning difficulties. Behavioural problems can themselves be classed as a form of mental health difficulty, and so called 'conduct disorders' appear to be on the rise: Bogels et al. 2008 found improvements in many aspects of difficult behaviour in adolescents suffering from 'externalizing disorders' following an MBI and a small case study Singh et al. 2007 finds that mindfulness helped 3 students reduce the aggressive behaviour that was putting them at risk of school expulsion.

Zylowska, L., Ackerman, D. L., Yang, M. H., Futrell, J. L., Horton, N. L., Hale, T. S., Pataki, C., and Smalley, S. (2007). 'Mindfulness meditation training in adults and adolescents with ADHD: A feasibility study'. *Journal of Attention Disorders*, 11(6): 737-746.

In a feasibility study, 24 adults and 8 adolescents with ADHD enrolled for an 8-week mindfulness training program. The majority of participants completed the training and reported high satisfaction with the training, as well as significant improvements pre–post in self-reported ADHD symptoms, test performance on tasks measuring attention, and cognitive inhibition, anxiety and depressive symptoms.

Singh, N. N., Lancioni, G. E., Singh Joy, S. D., Winton, A. S. W., Sabaawi, M., Wahler, R. G., and Singh, J. (2007). 'Adolescents with conduct disorder can be mindful of their aggressive behaviour'. *Journal of Emotional and Behavioural Disorders*, 15(1): 56–63.

<http://doi.org/10.1177/10634266070150010601>

This is a small case study of how an MBI helped 3 adolescents reduce the aggressive behaviour that was putting them at risk of school expulsion: students kept their behaviour within socially acceptable levels in school through to graduation after the intervention. Although too small to be generalisable, it is an interesting result.

Haydicky, J., Wiener, J., and Badali, P. (2012). 'Evaluation of a mindfulness-based intervention for adolescents with learning disabilities and co-occurring ADHD and anxiety'. *Mindfulness*, 3: 151. <https://doi.org/10.1007/s12671-012-0089-2>

This is a wait list (WL) evaluation of a 20-week mindfulness training program a clinical sample of adolescent boys with learning disabilities. Compared to the WL group, participants with co-occurring ADHD improved on parent-rated externalizing behaviour, oppositional defiant problems and conduct problems. Improvements were also apparent in hyperactive symptoms, inattentiveness and anxiety.

Beauchemin, J., Hutchins, T. L., and Patterson, F. (2008). 'Mindfulness meditation may lessen anxiety, promote social skills, and improve academic performance among adolescents with learning disabilities'. *Complementary Health Practice Review*, 13(1): 34–45. <http://doi.org/10.1177/1533210107311624>

A pre-post study of a 5-week mindfulness meditation intervention with 34 adolescents diagnosed with learning difficulties found improved behavior using teacher ratings.

Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F. and Diamond, A. (2015). 'Enhancing cognitive and social–emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial'. *Developmental Psychology*, 51(1): 52–66

Four classes of 99 4th and 5th graders were randomly assigned to receive the 12-week version of the *MindUP* program, which combines mindfulness and SEL, or attend an active control - a social responsibility program. *MindUP* students scored higher on sociability with significant improvements in sharing, trustworthiness, helpfulness, and taking others' perspectives, and significant decreases in aggressive behaviour.

Developing Skills for Learning, Attainment, Problem Solving, Reflection and Wisdom

The section *What does Mindfulness Mean and How Might it Work in Practice?* outlines the relationship between mindfulness and cognitive processes, such as meta-cognition, attentional

control and executive function, and suggests how essential they are to success in school and in life. If we look at the empirical numerical evidence for the impact of MBIs, the reviews cited in *Reviews of the Quantitative Evidence Base for Mindfulness with School Aged Youth* found small but positive evidence for impacts of MBIs on a range of aspects of cognition and executive function, especially abilities connected with the attention, and deduced reasonable evidence for impacts on learning and attainment, with small to medium impacts. There is growing evidence for the ability of mindfulness to impact on aspects of cognition, including executive function, especially for those with difficulties in this area, as a study by Flook et al. 2010 demonstrates. This is potentially highly attractive to schools and universities, drawn by the promise mindfulness holds of helping students train their attention, manage their thinking processes, reflect more deeply, and engage their increasingly distracted minds- all skills strongly associated with educational, personal and social effectiveness and well-being. Napoli et al. 2005, Semple et al. 2010 and Parker et al. 2014 all are studies that are suggestive of the ability of mindfulness to impact on the core executive function skill of directing, focusing and sustaining the attention. Black and Fernando 2013, Ricarte 2015 and Ramsberg and Youmans 2014 suggest that mindfulness can improve include working memory, and selective attention in school and university settings. Meta-cognition is the ability to stand back from the thought process and 'think about thinking'. It is an essential component of strategic thinking and problem-solving, as well as emotional and self-regulation. There is a growing evidence base for the ability of MBIs to develop meta-cognition in adults, and a small number of studies with young people, including Vickery and Dorjee 2016, suggest is shows promise.

Flook, L., Smalley, S. L., Kitil, M. J., Galla, B. M., Kaiser-Greenland, S., Locke, J., and Kasari, C. 'Effects of mindful awareness practices on executive functions in elementary school children'. *Journal of Applied School Psychology*, 26(1): 70–95, 2010.

This is a report of an RCT of 64 children aged 7–9 of the '*Mindful child*' curriculum of Kaiser Greenland which included exercises to promote attentional regulation and awareness of self, thoughts and feelings, and interconnectedness with others and the environment. Children with poor executive function showed significant improvements in behavioral regulation, metacognition and overall global executive control compared to the control group.

Napoli, M., Krech, P. R., and Holley, L. C. 'Mindfulness training for elementary school students.' *Journal of Applied School Psychology*, 21(1): 99–125.2005.

An early and influential study evaluated '*the Attention Academy*' programme, using an RCT design, and a large fairly sample of 228 participants. There was a significant improvement in teacher-rated attention and selective (visual) attention post treatment, as well as self-rated test anxiety and social skills, compared with control groups, with effect sizes ranging from small to medium.

Semple, R. J. Lee, J., Rosa, D. and Miller, L.F. "Randomized trial of mindfulness-based cognitive therapy for children: Promoting mindful attention to enhance social-emotional resiliency in children". *Journal of Child and Family Studies* 19:218–229, 2010.

A rare RCT of mindfulness with 25 low income, inner city children, aged 9- 13 in a clinical context, evaluated *Mindfulness-based cognitive therapy for children*, a manualized group psychotherapy developed to increase social-emotional resiliency through the enhancement of mindful attention. Those who completed the program showed fewer attention problems than wait-listed controls, improvements which were maintained three months later.

Parker, A. E., Kupersmidt, J. B., Mathis, E. T., Scull, T. M., and Sims, C. (2014). 'The impact of mindfulness education on elementary school students: evaluation of the Master Mind program'. *Advances in School Mental Health Promotion*, 7(3): 184–204

A controlled study of 111 elementary schools students, taught a four-week MBI, found significant improvements in executive functioning skills, in the form of the ability to ignore distractions while completing a task, compared with controls.

Black, D. S., and Fernando, R. (2013). 'Mindfulness training and classroom behaviour among lower-income and ethnic minority elementary school children'. *Journal of Child and Family Studies*, 23(7), 1242–1246. <http://doi.org/10.1007/s10826-013-9784-4>

Evaluated the effect of a 5-week mindfulness-based curriculum on teacher-ratings of 409 children (83 % enrolled in a California free lunch program and 95.7 % from an ethnic minority group). The children attended kindergarten through sixth grade, and were measured at pre-intervention, immediate post-intervention, and 7 weeks post-intervention. Teachers reported improved classroom behavior of their students, in terms of paying attention and self-control, improvements which lasted up to 7 weeks post-intervention.

Ricarte, Jorge, Laura Ros, Latorre, José & Beltrán, M.T. (2015). Mindfulness-based intervention in a rural primary school: Effects on attention, concentration and mood. *International Journal of Cognitive Therapy*. 8. 1-13. 2015.

A control trial compared two groups of 45 children, ages 6 to 13 from a rural school in Spain who participated in a 6-week, daily MBI. Compared with the control group the MBI group improved their concentration, and immediate auditory-verbal memory, although not their focused attention and working memory.

Ramsberg, J. and Youmans, R., (2014). Meditation in the higher education classroom: meditation training improves student knowledge retention during lectures. *Mindfulness*, 5, pp.431-441.

Examined the effects of mindfulness meditation on the knowledge retention of university students. In three experimental studies, participants from three introductory psychology courses randomly received either brief meditation training or rest, listened to a class lecture, then took a post-lecture quiz that assessed students' knowledge of the lecture material. The results indicated that meditation improved students' retention of the information conveyed during the lecture in each of the three experiments.

Vickery, C.E. and Dorjee, D. 'Mindfulness training in primary schools decreases negative affect and increases meta-cognition in children'. *Frontiers in Psychology*.
<http://dx.doi.org/10.3389/fpsyg.2015.02025> 2016.

This paper describes the evaluation of an 8-week mindfulness program (*Paws b*) for 71 children aged 7–9 from three primary schools in the UK, with a control group. It found that teacher reports (but not parental ratings) of meta-cognition showed significant improvements at follow-up, with a large effect size, compared with the control group. It also showed significant decreases in negative affect at follow-up, with a large effect size.

Academic Performance

Given the promising evidence of an impact on cognition and executive function, there has inevitably been interest and inquiry into whether mindfulness practice leads to higher levels of measurable academic performance and grade scores. Studies with adults suggest that mindfulness can improve mental, physical, intellectual and creative performance of many kinds, including academic learning, and studies of MBIs in school settings have concluded, from a scattering of results, that mindfulness with young people also has promise in this regard.

Beauchemin et al. 2008 found impact on academic performance and on test and grades scores of adolescents in various areas, Franco Justo 2009 and Franco Justo et al. 2011 assessing the a Spanish mindfulness programme found improvements in tests of verbal creativity, Spanish language and literature, foreign languages, and philosophy, while Bakosh et al. 2016 found improvements in elementary students grade scores in reading and science grades and Schonert-Reichl et al. 2015 reported significant gains in teacher-reported maths achievement. There is a small but growing literature on the impact of mindfulness on the cognitive abilities and test scores of university students of which Mrazek et al. 2013 is a good representation. The growing number of studies reporting findings on the influence of mindfulness on academic performance could be seen either as the holy grail for mindfulness in education, or as introducing a sense of instrumentalism, competition and striving that is antithetical the whole spirit of the enterprise. A balanced reflection might be that, if not oversold, such instrumental findings may be helpful to efforts to introduce mindfulness into schools and universities in the first place, after which it may be that the deeper human benefits begin to be apparent if the teaching is of sound quality.

Beauchemin, J., Hutchins, T. L., and Patterson, F. (2008). 'Mindfulness meditation may lessen anxiety, promote social skills, and improve academic performance among adolescents with learning disabilities'. *Complementary Health Practice Review*, 13(1): 34–45.

<http://doi.org/10.1177/1533210107311624>

A pre-post study of a 5-week mindfulness meditation intervention with 34 adolescents diagnosed with learning difficulties found improved academic performance, using teacher ratings.

Franco Justo, C. (2009). 'Effects of a meditation program on verbal creative levels in a group of students in late secondary education'. *Suma Psicológica* 16:113–120.

In RCT of a Spanish programme, *Meditación Fluir* is based on a selection of MBSR practices such as open mindedly letting thoughts come and go, observing the breath, and body scan. Sixty boys and girls (Franco, 2009) with a mean age of 17.3 years were divided equally and at random into two groups. Those who received the 10-week programme showed significant improvements in tests of verbal creativity compared with controls.

Franco Justo, C., Mañas, I., Cangas, A. J., and Gallego, J. (2011). 'Exploring the effects of a mindfulness program for students of secondary school'. *Int. J. Knowl. Soc. Res.* 2: 14–28. doi: 10.4018/jksr.2011010102

An RCT using a wait list design of the Spanish programme *Meditación Fluir* with 61 first year high school students, with a mean age 16.3. Students were taught a 1½ session once a week for 10 weeks and expected to practice daily for 30 minutes. Significant improvements were found in academic performance in Spanish language and literature, foreign languages, and philosophy (the three subjects examined). Students also improved their self-concept and reported reduced test related anxiety.

Bakosh, L. S., Snow, R. M., Tobias, J. M., Houlihan, J. L., and Barbosa-Leiker, C. (2016). 'Maximizing mindful learning: mindful awareness intervention improves elementary school students' quarterly grades'. *Mindfulness.* 7 (1), 59–67.

A control trial of a 10 minutes a day audio guided mindful awareness training program for 191 elementary school students found that being in the intervention group predicted improved grades for reading and science grades (although for not maths, writing, spelling, or social studies).

Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F. and Diamond, A. (2015). 'Enhancing cognitive and social–emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial'. *Developmental Psychology*, 51(1): 52–66

An RCT of the *MindUP* curriculum that combines mindfulness and gratitude practice with SEL and neuroscience with 99 fourth- and fifth-grade classrooms reported significant increase in self-reported school self-concept (i.e. perceived academic abilities and interest and enjoyment) and a 15 % gain in teacher-reported maths achievement.

Michael D. Mrazek, Michael S. Franklin, Dawa Tarchin Phillips, Benjamin Baird, Jonathan W. Schooler. Mindfulness training improves working memory capacity and GRE performance while reducing mind wandering. *Journal of Psychological Science.* 24 (5): 776-78. 2013.

Forty-eight undergraduate students were randomly assigned to either a mindfulness class (n = 26) or a nutrition class (n = 22) and met for 45 min four times a week for 2 weeks. Mindfulness training improved reading-comprehension scores and working memory capacity while reducing the occurrence of distracting thoughts during completion of the tests.

Improvements were most apparent in those who had been shown to be more prone to distraction at pretesting.

Improving Physical Health

Mindfulness is an embodied practice. The wisdom traditions from which mindfulness originated did not share the modern western dualistic distinction between mind and body and encouraged practitioners to bring the same equanimous attitudes towards their shifting experience, whether it be in the breath, body sensations, sound, or passing thoughts and feelings. The seminal work introducing secular mindfulness, Kabat-Zinn 2013, was founded on the assumption that mindfulness is essentially embodied, indeed his work began in a clinical context to help patients respond differently to their pain and illness. Subsequent investigations of the impacts of mindfulness on physical aspects of health are well summarised in meta-analyses reported by Black et al. 2015. These conclude that mindfulness can have a significant impact on physical well-being, including pain, medical disorders such as psoriasis and fibromyalgia, and indicators such as blood pressure and heart rate. Impacts on physical indicators have been hypothesised as relating to the apparent ability of mindfulness to interrupt the psycho-biological response to chronic stress through its effect on the hormonal, cardiovascular and immune systems, and on its ability to cultivate the relaxation response. Compared with work with adults, the impact of MBIs on the physical health and well-being of children and young people is relatively unexplored territory: there is some promising early evidence but not yet enough studies to calculate overall significance. Methodologically however, work in this area is breaking new ground for mindfulness by moving away from the familiar self-report to explore indicators in physiological signs and symptoms: Barnes et al. 2004 finds impacts on systolic and diastolic blood pressure, and ambulatory heart rate, Gregoski et al. 2011 also finds beneficial changes in blood pressure and heart rate, plus urinary sodium excretion rate, while Sibinga et al. 2013 finds reductions in levels of cortisol (the 'stress hormone'). Young people are generally increasingly short of sleep, which is also a common side effect of mental health problems: Bei et al. 2013 found significant improvement in patterns surrounding sleep, sleep quality and total sleep time after an MBI in adolescent girls. Eating disorders are affecting an increasing number of young people, while at the other end of the scale obesity is set to become a global epidemic as western eating habits take hold. Mindful eating practice is a regular part of most mindfulness courses, including with young people, with participants invited to eat slowly, savoring the food, with awareness of the sensations that accompany eating. As reported by Atkinson et al. 2015 and Barnes et al. 2016,

mindful eating has shown promising early results for a wide range of dietary and eating related problems.

Kabat- Zinn, Jon. *Full Catastrophe Living, Revised Edition: How to Cope with Stress, Pain and Illness Using Mindfulness Meditation*. Barnes and Noble, Peabody Massachusetts. 2013.

Based on the original MBSR programme at the University of Massachusetts Medical Centre by the originator of secular mindfulness, this manual outlines its origins in work to help patients with intractable conditions cope with stress, anxiety, pain and illness, and the continued work to explore links between mindfulness, the body and physical health. This new edition has been revised and updated to include the latest research.

Black, D. S. 'Mindfulness training for children and adolescents: A state-of-the-science review'. In K. W. Brown, J. D. Creswell, and R. M. Ryan (Eds.), *Handbook of Mindfulness: Theory, Research, and Practice*. New York: Guilford, 2016.

A systematic review of 41 MBI studies, including 13 RCTs, conducted in school and clinical settings. It concluded that MBIs in schools reliably impact on wide range of indicators of well-being including measures of psycho-biological outcomes such as blood pressure and heart rate. Impacts were also shown on: aspects of cognition and executive function, particularly the ability to pay attention; psycho-social variables such as emotional regulation; interpersonal relationships; and mental health issues including stress, depression and anxiety.

Barnes, V. A., Davis, H. C., Murzynowski, J. B., and Treiber, F. A. (2004). 'Impact of meditation on resting and ambulatory blood pressure and heart rate in youth'. *Psychosomatic Medicine*, 66, 909–914. <http://dx.doi.org/10.1097/01.psy.0000145902.91749.35>.

This was an RCT with 73 African American middle school students who received either 10 minute daily mindful breathing sessions for 3 months or a health education class. Significant differences were found between the intervention and control groups for systolic and diastolic blood pressure, and for ambulatory heart rate.

Gregoski, M. J., Barnes, V. A., Tinggen, M. S., Harshfield, G. A., and Treiber, F. A. (2011). 'Breathing awareness meditation and life skills training programs influence upon ambulatory blood pressure and sodium excretion among African American adolescents'. *Journal of Adolescent Health*, 48: 59–64. <http://dx.doi.org/10.1016/j.jadohealth.2010.05.019>.

In an RCT of a breathing meditation with 166 adolescents who were at risk of cardiovascular disease, significant group differences were found for changes in blood pressure, heart rate and urinary sodium excretion rate in the intervention group (behavioral stress induces increased sodium retention) over a 24-hour period and during school hours.

Barnes, V. A., Pendergrast, R. A., Harshfield, G. A., and Treiber, F. A. (2008). 'Impact of breathing awareness meditation on ambulatory blood pressure and sodium handling in prehypertensive African American adolescents'. *Ethnicity and Disease*, 18, 1–5.

This was an RCT with 66 ninth graders (aged 12-14) at risk of hypertension where the study found a reduction in overnight urinary sodium excretion rate in the intervention group (behavioral stress induces increased sodium retention).

Sibinga, E. M. S., Perry-Parrish, C., Chung, S., Johnson, S. B., Smith, M., and Ellen, J. M. (2013). 'School-based mindfulness instruction for urban male youth: A small randomized controlled trial'. *Preventive Medicine*, 57(6): 799–801

An RCT of a school-based MBSR program for 42 children eleven and twelve-year olds, in a small school for low-income urban boys, 95% of whom were African American. Cortisol levels (the 'stress hormone') increased during the school term for the control group participants but remained constant for MBSR participants, suggesting a possible attenuation of cortisol response to stress. The intervention group also showed less anxiety and improved coping skills, assessed by self-report.

Bei, B., Byrne, M. L., Ivens, C., Waloszek, J., Woods, M. J., Dudgeon, P., and Allen, N. B. (2013). 'Pilot study of a mindfulness-based, multi-component, in-school group sleep intervention in adolescent girls'. *Early Intervention in Psychiatry*, 7(2): 213–220.

Using a pre-post design, this evaluation studied 10 students at a girls' school aged 13-15 with self-reported poor sleep, who were enrolled into a six-session program which combined mindfulness concepts and practice with sleep related advice, skills and education. They showed significant improvement in patterns surrounding sleep, sleep quality and total sleep time after the intervention, using self-report measures.

Barnes, V.A., Kristeller, J.L., and Johnson, M.H. 'Impact of mindfulness-based eating awareness on diet and exercise habits in adolescents.' *Int J Complement Alt Med* 3(2): 00070. DOI: 10.15406/ijcam.2016.03.00070, 2016.

A 12 week mindfulness based eating awareness programme (MB-EAT) was subject to an RCT, with 40 ninth grade adolescents who were randomly assigned to the intervention or a health education class. Results showed that, relative to controls, the MB-EAT-A group increased their levels of moderate exercise and their intake of low calorie, low fat foods.

Atkinson, M. J. and Wade, T. D. 'Mindfulness-based prevention for eating disorders: A school-based cluster randomized controlled study'. *Int. J. Eat. Disord.*, 48: 1024–1037.

doi:10.1002/eat.22416, 2015.

An RCT with 347 adolescent girls randomly allocated to a 3-session of mindfulness-based body awareness, adapted from MBCT, or to a control group. Students receiving the MBI demonstrated significant reductions in weight and shape concern, dietary restraint, thin-ideal internalisation, eating disorder symptoms and psychosocial impairment, relative to controls, tested after 6 months when the programme was facilitated by the best trained leader: the programme showed no difference when tutors were trained briefly.