

Topic

Mindfulness, Mindsight, and The Mind: What Are They, and Why Do They Matter? by Daniel J. Siegel, M.D.

In this 90-minute video, Dr. Dan Siegel explores the areas of mindfulness, attention, and consciousness through an interpersonal neurobiology and mindsight lens. By looking closely at the history of mindfulness, a detailed understanding of the mind, and the neural structure that underlies the subjective experience of being mindful, we begin to understand how a mindfulness practice supports integration, health, and overall well-being.

Mindsight Digital Journal, Issue No. 1, March 2016

Applications for all Professionals and General Interest

A. Mindfulness and Mindful Awareness (1:38-11:12)

- While researchers have not yet agreed on a single definition of *mindfulness*, it is understood to be the process of paying attention to what's happening as it's happening, and there is a universal finding among a wide range of cultures and religions that being aware of the present is somehow good for you
- *Mindful awareness* is awareness of the present; however, there is a difference between awareness and attention. *Attention* is the process that regulates the flow of information, within us and between ourselves and others, while *awareness* includes subjective experience – a felt texture – and the experience of knowing
- Attention can exist without awareness. This helps a person live more efficiently; if all aspects of daily life were in awareness, it would be quite overwhelming
 - *Focal attention* refers to the process of directing attention within awareness
 - *Nonfocal attention* is the process of directing energy and information flow without awareness

Differentiated Neurological Processes of Attention	
Limbic Region	Associated with appraisal processes via areas like the amygdala
Anterior Cingulate	Associated with allocation of attention, emotional regulation, pain perception, and social processing
Prefrontal Cortex	Associated with cognitive processes like judgment, thinking, awareness, and perception

B. Brief History of Mindful Awareness (11:12-20:54)

- *Mindfulness meditation* is a specific approach to training the mind that derives from the Theravada branch of Buddhism and is known as *vipassana*, which refers to insight into the true nature of reality, or clarity. Vipassana is preceded by the training of a more stable attention, called *shamata*
- In the late 1970s, researchers like Sharon Salzberg, Jack Kornfield, Joseph Goldstein began the Insight Meditation Center in Massachusetts to provide mindfulness training. Jon Kabat-Zinn then extracted and secularized the mindfulness meditation component from Buddhism, developing *mindfulness-based stress reduction* (MBSR) at the University of Massachusetts, which he began to study in hospital settings with those experiencing chronic pain. Researchers began to notice that MBSR led to patient improvement – both in subjective report and in objective measures of physiology
- In the early 2000s, methodologically rigorous studies of mindfulness began to emerge

Mindsight Digital Journal, Issue No. 1, March 2016

C. Mindfulness Training (20:54-33:08)

“Mindfulness means paying attention in a particular way; on purpose, in the present moment non judgmentally.”
- Jon Kabat-Zinn

- Mindfulness is a particular way of being in the world; it is a specific state or quality of awareness within consciousness.
- *Nonjudgmental* is a term that Kabat-Zinn has said refers to the ability to view one’s mental process as mental processes – without being swept up by previously established expectations, assumptions, and filters
- MBSR training can help people distinguish two separate pathways of energy flow – a *sensory flow*, which is awareness of sensations from the outside world or from within the body, called interoception, and an *observational flow*, which is awareness of how we make sense of these stimuli through beliefs, feelings, thoughts, and perceptions

OWN Circuit of Energy Flow
Observes
Witnesses
Narrates

Focus of the OWN Circuit
Others
And
The
Self

- Centralized, default-mode processing is a midline system of the brain that we can call the OWN circuit and focuses on OATS. Mindfulness, which from an IPNB point of view can be seen as a form of integration, allows us to differentiate streams of energy, freeing us the often dominant default-mode processing that can keep us distant from the here-and-now by worrying about the past or fearing the future as well as being preoccupied with others and the self

Differentiated Streams of Energy
Sensation
Observation
Concept
Knowing

D. Neural Correlates of Mindfulness (33:08-57:51)

- While the process of mindfulness meditation overlaps with other mindfulness practices, such as yoga, tai chi, or centering prayer, the earliest projects and thus the majority of empirical research available focus on insight meditation
- Everyday activities, like washing dishes, can be made into a mindfulness practice through intentional, focused streams of attention, creating a specific state of being open to what is happening as it is happening.
- The reason this mind training creates specific changes in the brain is because of this axiom:

Mindsight Digital Journal, Issue No. 1, March 2016

Changes in Neural Function and Structure	
Synaptic Modulation (Synaptogenesis)	The formation and modulation of neural synapses; “Neurons that fire together, wire together”
Epigenetic Modulation (Epigenesis)	The alteration of the control of gene expression—in this case via experience and learning—that involves laying down of non-nucleic acid molecules on top of genes (which are comprised of DNA—chains of nucleic acids)
Neurogenesis	The generation of new neurons from neural stem cells that divide and can create new neurons early in life and especially in the hippocampus throughout the lifespan
Myelinogenesis	The laying down of a myelin sheath around interconnected nerve fibers, leading to increased firing speed and enhanced coordination of neural firing

Where attention goes, neural firing flows, and neural connection grows.

- We promote neural connection through stimulation of circuitry
- *Practice* refers to the process of focusing attention with *intention*. When we are aware of what is in awareness and pay attention to our intention, the *salience circuit* of the anterior cingulate is active, monitoring the nature of our awareness moment by moment
- During practice, our attention may no longer match our intended focus, and at these times, we can use self-compassion to redirect attention back to our intended focus, such as the breath or a particular part of the Wheel of Awareness, for example
- Through mindfulness practice with a focused, intentional streaming of attention, we are distinguishing the salience circuit, from the sensory circuit, from the OWN circuit—a form of differentiation, which then become linked over the course of the mindfulness practice. This is one way of seeing mindfulness training as an integration practice
- *Vipassana* practice begins with *shamatha*, a form of attention training, then moves into an *open awareness* practice, where the intention is to open the mind and bring attention to whatever emerges; this open awareness can be experienced as an invitation for innovation and the creation of new combinations
- Through mindfulness practice, we develop *metacognitive skills* and build the circuitry that allows us to notice if we have become lost in a thought or locked into a flow; we can begin to identify objects and mental processes as mental activity – rather than absolute beliefs; we realize that there is a pause between impulse or desire and action, and we can choose to have a *reflective* response rather than a *reactive* response

E. Kind Awareness (57:51-1:13:00)

- *Kindness* refers to doing something for another without an expectation of receiving anything in return; it is honoring and supporting one another’s – or one’s own – vulnerabilities
- *Compassion* – sensing the suffering of another and reaching out to reduce suffering – and compassion training are fundamental to mindfulness, though

Mindsight Digital Journal, Issue No. 1, March 2016

some researchers and practitioners feel that compassion development and focal attention are distinct from mindfulness

Observed Structural Changes in the Nervous System Due to Mindfulness Practice

1. Improvements in immune system function
2. Left shift, meaning the left frontal area of the brain becomes more electrically activated after MBSR, an area associated with approaching challenges rather than withdrawing or avoiding challenges
3. Increase in growth in the integrative, prefrontal areas
4. Increase in growth in the corpus callosum, which links the left and right sides of the brain to each other
5. Increase in growth in the hippocampus, which links memory systems together
6. Increase in growth in the default mode circuitry, which links the front and back side of the brain – including areas like the OVN circuit
7. Neural integration can be proposed as the overall impact of mindfulness training, in that specific areas of the brain and nervous system are being differentiated and linked
8. Neural integration is enhanced, and neural integration is the mechanism beneath the regulation of attention, mood and emotion, thought, behavior, and interpersonal relationships
9. Telomerase, an enzyme that repairs and restores the ends of chromosomes, has its levels increased with mental presence
10. Optimization of the non-DNA molecules – epigenetic modulators, which help prevent inflammatory diseases

F. Mindsight (1:13:00-1:28:18)

- Mindsight skills support secure attachment patterns through a parent's ability to attune to the inner world of the child and build a map of the inner world of another – something known as *mentalization*

Mindsight Digital Journal, Issue No. 1, March 2016

The Three Components of <i>Mindsight</i>
Insight: Reflecting with awareness by focusing attention on the internal, subjective world of one's own interior mental experience, including feelings, thoughts, memories
Empathy: Sensing the inner experience of another within one's own mind; forming a mental map of another; feeling <i>felt</i> by an empathic other is the foundation of a supportive relationship
Integration: The differentiation or specialization, and, ultimately, linkage of systems including the brain and interpersonal relationships; without integration, chaos, rigidity, or both emerge, resulting in a state of mental dysfunction; with integration, harmony emerges with flexibility, adaptability, coherence, stability, and energy (a FACES flow)

Commonalities of Mindfulness and Secure Attachment Development	
1.	Ability to regulate the body
2.	Ability to tune into others
3.	Emotional balance and regulation
4.	Response flexibility
5.	Ability to soothe and down-regulate fears
6.	Insight
7.	Empathy
8.	Morality
*9.	Access to Intuition - Interoception

G. The Mind (1:28:18-1:42:00)

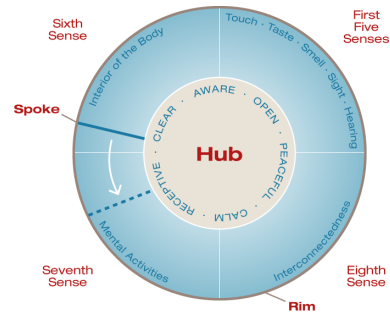
- The mind is not brain activity; consciousness and subjective experience may be dependent upon but are not the same as neural firing
- The mind is an embodied and relational process of energy and information flow that is emergent and self-organizing, existing both within us and between us

Mindsight Digital Journal, Issue No. 1, March 2016

Quantum Physics and the Nature of Reality: Important Findings	
1. Conscious Observation	The act of observation of a photon – the fundamental element of light energy – collapses the wave function, reducing the state function: a photon can be a particle or acting like a probability distribution, like a wave. The commonly held Copenhagen Interpretation of quantum physics suggests that the act of being aware – conscious observation – changes energy patterns and changes the probability function into a certainty (acting like a particle, no longer like a wave)
2. Entanglement	The finding that changing the state of one entity instantaneously changes the position of a related entity, like an electron somewhere else; this suggests an interconnectedness that “acts at a distance.” This has recently been established empirically for matter as well...could this include the mental experience of individuals? Not known, but if mind emerges from energy flow, why wouldn't this be a property of mind as well...?
3. Reality as Probability & Potential	<p>Reality is based on probabilities – not certainties; mindfulness practices, like the wheel of awareness practice, strengthen our abilities to be consciously aware. <i>Energy</i> is the capacity to do something, and a range of energy probabilities from 0% to 100% exists</p> <div style="text-align: center;"> </div> <ul style="list-style-type: none"> • 100% probability = Certainty • Near 0% probability = Uncertainty, or <i>Open Possibility</i> • Plateaus of probability constrain these options as mood or intention; specific thoughts or emotions or memories are depicted as peaks of activation—the transformation of possibility into actuality • The hypothesis: awareness arises when the energy probability position is in the infinite plane of possibility – free from top-down influence and, instead, a source in openness and the source of possibilities

Mindsight Digital Journal, Issue No. 1, March 2016

- The *Wheel of Awareness* practice differentiates the process of *knowing* from the *known*, and this integration of consciousness cultivates change as we systematically link differentiated parts and adaptively flow through peaks of certainty and the open plane of possibility



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Dr. Siegel's Wheel of Awareness practice is available at:
http://www.drdansiegel.com/resources/wheel_of_awareness/

- By holding a transcendent worldview of “we” – viewing the self as part of a larger, connected system of people and planet in an interconnected *mindsphere* – combined with our internal experience of a “me” within our inner mindscape, we create a sense of *MWe*

Mindsight Digital Journal, Issue No. 1, March 2016

Annotated Bibliography of Books Referenced and for Further Reading

1. For All Professional Groups, Parents, and General Interest

- a. Ackerman, D. (2014). *The human age: The world shaped by us*. New York, NY: W.W. Norton & Company. *A timely and profound discussion of how human beings have been shaping our global environment and what we are doing and can do to help our world.*
- b. Davidson, R. & Begley, S. (2012). *The emotional life of your brain: How its unique patterns affect the way you think, feel, and live – and how you can change them*. New York, NY: Penguin Group. *An accessible overview of Richard Davidson's research projects and his view of how the mind can be trained to improve many aspects of life.*
- c. Frankl, V. E. (1985). *Man's search for meaning*. Simon and Schuster. *A classic exploration of Logotherapy and the ways in which we seek meaning and purpose in our lives.*
- d. Fredrickson, B.L. (2013). *Love 2.0: Finding happiness and health in moments of connection*. New York, NY: Penguin Group. *Expanding the notion of "love" to include what this leader in the field of social and positive psychology calls "positivity resonance", this book offers an uplifting and practical guide to increasing the quality of one's relationships in the world.*
- e. Germer, C.K., Siegel, R.D., & Fulton, P.R. (2013). *Mindfulness and psychotherapy* (2nd Ed). New York, NY: Guilford Publications. *Explores both the direct and indirect ways mindfulness can enhance the experience of psychotherapy—for both client and therapist.*
- f. Goleman, D. (2013). *Focus: The hidden driver of excellence*. New York, NY: HarperCollins. *So much of our lives are filled with distraction, and this book offers a deep dive into the ways we can strengthen our focus of attention to improve our lives.*
- g. Kabat-Zinn, J. (2012). *Mindfulness for beginners: Reclaiming the present moment and your life*. Boulder, CO: Sounds True. *Exploring the fundamentals of meditation, this book provides an excellent introduction to not only the practice of mindfulness training but the ways of being mindful.*
- h. Kabat-Zinn, J., Wheeler, E., Light, T., Skillings, A., Scharf, M. J., Cropley, T. G., ... & Bernhard, J. D. (1998). Influence of a mindfulness meditation-based stress reduction intervention on rates of skin clearing in patients with moderate to severe psoriasis undergoing photo therapy (UVB) and photochemotherapy (PUVA). *Psychosomatic medicine*, 60(5), 625-632. *A startling and now repeated*

Mindsight Digital Journal, Issue No. 1, March 2016

study, this is the original finding that simply listening to Kabat-Zinn's tape of a mindfulness meditation during a light treatment session leads to four times the speed of clearing of inflammatory lesions.

- i. Kaiser Greenland, S. (2010). *The mindful child: How to help your kid manage stress and become happier, kinder, and more compassionate*. New York, NY: Free Press. *Written by a gifted teacher of mindfulness, this book is a wonderful compendium of creative ways to teach mindfulness to children.*
- j. Kornfield, J. (2012). *Bringing home the dharma: Awakening right where you are*. Boston, MA: Shambhala Publications. *The "dharma" means the ways of the mind, the truths about life, that we can not only learn but also practice in our daily lives—and this book reveals how to "bring this truth home."*
- k. Neff, K. (2015). *Self-compassion: The proven power of being kind to yourself*. New York, NY: HarperCollins Publishers. *A leading researcher in the field of self-compassion offers her own journey along with helpful and research-proven practices to enhance self-compassion in your life.*
- l. O'Donohue, J. (2011). *Four elements: Reflections on nature*. New York, NY: Harmony Books. *Published after his unfortunate and early death, this book is a compilation of John O'Donohue's essays on the natural world he loved so much.*
- m. Salzberg, S. and Goldstein, J. (2002). *Insight meditation: A step-by-step course on how to meditate*. Boulder, CO: Sounds True. *Two of the initial pioneers bringing mindfulness meditation to the West offer their guide to learning these now research proven steps to enhancing quality of life.*
- n. Shapiro, S. & White, C. (2014). *Mindful discipline: A mindful approach to setting limits & raising an emotionally intelligent child*. Oakland, CA: New Harbinger Publications, Inc. *A mindfulness scholar and pediatrician offer a helpful guide to bring mindfulness to discipline.*
- o. Siegel, D. J. (2012). *Pocket guide to interpersonal neurobiology: An integrative handbook of the mind*. New York, NY: W.W. Norton & Company. *A non-linear (and playful!) book that enables readers to explore the field of interpersonal neurobiology by flowing through passages and passions at their own discretion, the Pocket Guide provides a journey into IPNB in which the topic of the mind and the process of reading are parallel experiences.*
- p. Siegel, D. J. (2008). *The Mindful Brain: The Neurobiology of Well-being*. Sounds True. *This is an audio recording of an overview of what being mindful may be all about, as seen from a newcomer's point of view—distinct from the book of the same name!*

Mindsight Digital Journal, Issue No. 1, March 2016

- q. Siegel, D. J. (2010). *Mindsight: The new science of personal transformation*. New York, NY: Random House. *Highlighting the centrality of integration—the linkage of differentiated parts of a system—in the cultivation of well-being, this book is filled with case examples in stories and scientific discussions to illustrate and illuminate the core of IPNB in everyday life.*
- r. Siegel, D. J. (2012). *The developing mind: How relationships and the brain interact to shape who we are*. New York, NY: Guilford Press. *A core text for graduate and undergraduate programs in human development, this book's second edition updates the scientific studies supporting the essential proposals of interpersonal neurobiology focusing on integration and the connections among relationships, brain, and mind.*
- s. Siegel, D. J. (2007). *The mindful brain: Reflection and attunement in the cultivation of well-being* (Norton Series on Interpersonal Neurobiology). WW Norton & Company. *As a newcomer to the field of mindfulness, the author (me) provides an inside view of what being in a week-long silent retreat was like and what the interpersonal neurobiology perspective might offer in trying to make sense of mindful awareness.*
- t. Siegel, D. J. (2010). *The mindful therapist: A clinician's guide to mindsight and neural integration* (Norton Series on Interpersonal Neurobiology). WW Norton & Company. *This book provides the new or experienced therapist with a step-by-step process to weave an interpersonal neurobiology view of well-being with the ways we can be aware of the present moment and create presence and connection in our lives.*
- u. Zylowska, L. (2012). *The mindfulness prescription for adult ADHD*. Shambhala Publications. *The leading researcher for the UCLA Mindful Awareness Research Center (MARC.ucla.edu) offers practical steps for strengthening attention through the mindfulness meditation research program we carried out as a pilot project at our center.*

(More Reading for Mental Health Professionals, Educators, Executives and Coaches on the next page.)

Mindsight Digital Journal, Issue No. 1, March 2016

2. Further Reading For Mental Health Professionals, Educators, Executives, and Coaches

- a. Ainsworth, M.D.S., Blehar, M.C., Waters, E., & Wall, S.N. (2015). *Patterns of attachment: A psychological study of the strange situation*. New York, NY: Psychology Press. *This is a review of the original "gold standard" of attachment, the infant strange situation, that can be then correlated with the adult attachment interview, revealing how a narrative of making-sense of one's childhood is the best predictor of the child's attachment to that parent.*
- b. Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., ... & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical psychology: Science and practice*, 11(3), 230-241. *An excellent example of attempting to operationalize what mindfulness really means and how to state this as a definition.*
- c. Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development*. New York, NY: Basic Books. *One of the founders of attachment theory explores the centrality of attachment for the development of well-being.*
- d. Bateman, A.W. & Fonagy, P. (2011). *Handbook of mentalizing in mental health practice*. Arlington, VA: American Psychiatric Publishing, Inc. *Part of the narrative analysis of the adult attachment interview explores the capacity of the adult to "mentalize" or reflect on the nature of mental processes. This book explores the importance of that reflective skill of mentalization in clinical interventions.*
- e. Epel, E. S., Blackburn, E. H., Lin, J., Dhabhar, F. S., Adler, N. E., Morrow, J. D., & Cawthon, R. M. (2004). Accelerated telomere shortening in response to life stress. *Proceedings of the National Academy of Sciences of the United States of America*, 101(49), 17312-17315. *An early study revealing how scientists discovered the important role the ends of our chromosomes, our telomeres, and telomerase, the enzyme that repairs them, play in our well-being and how these are challenged by stress (and later we'd learn reversed with mindfulness practice).*
- f. Farb, N. A., Segal, Z. V., Mayberg, H., Bean, J., McKeon, D., Fatima, Z., & Anderson, A. K. (2007). Attending to the present: mindfulness meditation reveals distinct neural modes of self-reference. *Social cognitive and affective neuroscience*, 2(4), 313-322. *An excellent example of disentangling the components of mindfulness, revealing the two streams of sensation and observation, which we can view as the differentiation of mindfulness that then becomes part of the integration as we link these together.*

Mindsight Digital Journal, Issue No. 1, March 2016

- g. Fonagy, P., & Target, M. (1997). Attachment and reflective function: Their role in self-organization. *Development and psychopathology*, 9(04), 679-700. *One of the original papers on the importance of reflecting on the mind of the child in the attachment relationship—now called by Fonagy and colleagues, “mentalization.”*
- h. Hebb, D. O. (2005/1949). *The organization of behavior: A neuropsychological theory*. United Kingdom: Psychology Press. *A classic original book that had the message, though not specifically stated and instead coined by Carla Shatz later on as a paraphrase of Hebb, that “neurons which fire together, wire together”—and the origin of the term, the “Hebbian synapse”.*
- i. Hölzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T., & Lazar, S. W. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research: Neuroimaging*, 191(1), 36-43. *Anatomical changes are now known to be important results of mindfulness meditation practice supporting the notion mentioned earlier that where attention goes, neural firing flows, and neural connections grow.*
- j. Kafatos, M.C. & Nadeau, R. (2013). *The conscious universe: Parts and wholes in physical reality*. New York: Springer. *A fascinating exploration of a quantum physics view of how the act of observation alters the probability function of energy.*
- k. Langer, E.J. (1998). *The power of mindful learning*. Cambridge, MA: Perseus Books. *Noticing distinctions and avoiding premature closure of perception is explored in this seminal work on the power of this form of mental receptivity to create not only more enjoyable and lasting learning, but also well-being.*
- l. Lieberman, M. D. (2011). Why symbolic processing of affect can disrupt negative affect: Social cognitive and affective neuroscience investigations. *Social neuroscience: Toward understanding the underpinnings of the social mind*, 188-209. *A leader in the field of social neuroscience reveals how we need both our affective and our linguistic centers to create balance in our lives.*
- m. Majdan, M. & Shatz, C.J. (2006). Effects of visual experience on activity-dependent gene regulation in cortex. *Nature Neuroscience* 9:650-9. Epub 2006 Apr 2. *An example of how energy streaming into the nervous system—the basis of experience—activates genes that catalyze the growth of neural connections.*
- v. Rosenkranz, M. A., Davidson, R. J., MacCoon, D. G., Sheridan, J. F., Kalin, N. H., & Lutz, A. (2013). A comparison of mindfulness-based stress reduction and an active control in modulation of neurogenic inflammation. *Brain, Behavior, and Immunity*, 27, 174-184. *Researchers reveal how the control group matters in careful studies, this revealing how physiological measures may reveal more than self-reports for meditation studies.*

Mindsight Digital Journal, Issue No. 1, March 2016

- w. Siegel, D. J. (2007). Mindfulness training and neural integration: differentiation of distinct streams of awareness and the cultivation of well-being. *Social Cognitive and Affective Neuroscience*, 2(4), 259-263. *A discussion of the Farb, et al, paper described earlier that dives deeply into how their findings can be seen as empirical support for the integration of consciousness at the heart of mindful awareness.*
- x. Singer, T., & Lamm, C. (2009). The social neuroscience of empathy. *Annals of the New York Academy of Sciences*, 1156(1), 81-96. *Leading researchers reveal ways of studying the nature of empathy, and later in their work, compassion.*