

Mindfulness in the Light of Neurobiological Research

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INTRODUCTION

Good morning, friends and colleagues!

Before we start our discussion, I'd like to share a bit of my background with you, so that you know the orientation from which I'm approaching today's topic. I'm a body-centered psychotherapist. My career began about 30 years ago, when I worked in a psychiatric hospital while studying psychology at the University of Hamburg. Although my basic training was in Rogerian Therapy and Behavior Modification, my interest from the beginning was actually depth psychology. A few years after finishing school, I very consciously and deliberately turned towards body-centered psychotherapy. In 1980, my teacher Ron Kurtz, several colleagues and I was founded the Hakomi Institute in the United States. The Institute has since trained hundreds of psychotherapists in about 30 countries.

I mention all this to clarify that I am, so-to-speak, a hard-core body-psychotherapist, who draws most of his perceptions and experiences from this realm. And I also want to emphasize that I am a practitioner, not a neurologist or brain physiologist; which means that I do not bring any technical expertise on the scientific aspect of the subject that I am addressing. My limited knowledge of neuropsychology is based on the keen interest with which I have followed the research over the years. The research that I will present mostly stems from secondary literature, from folks like Allan Schore, Daniel Siegel, or Christian Gottwald.

My participation in this discussion, then, is based of my three decades of psychotherapeutic experience, and my excitement that the newer brain research may provide some interesting hypotheses about therapeutic strategy from the practitioner's angle.

With this excitement, however, must first come a few words of caution.

I had a conversation recently with Gunter Heisterkamp, a leading German psychoanalyst, who became a body psychotherapist. He wisely pointed out to me — and I agree with what he said — that we must take great care to avoid the long-standing psychological tradition of putting our energies into trying to appear as scientific as possible, and, in so doing, watering down our own concepts in order to adapt them to the so-called "hard" sciences. This is usually done, he warned, in the hope of being acknowledged.

In addition, Joseph Ledoux, one of the great contemporary researchers in the field of neuropsychology, gave a talk some months ago in Frankfurt, in which he underlined how speculative the present interpretations of research are, and how little we can take for hard fact.

As I see it, neuropsychology is just not far enough along yet for any of us to draw indisputable conclusions about its discoveries. Plus, it describes a totally different dimension of people than the one we therapists typically reference when we reflect upon the practice of our art.

So I ask you, please, to understand my presentation as a cautious attempt to interpret some of the newer perspectives in neuropsychology from the unique point of view of a therapy practitioner.

OVERVIEW

Among the many diverse aspects of this subject, I would like to address three that I believe to have particular relevance to the organization of consciousness, ego-structure, and the practice of psychotherapy. They are:

(TRANSPARENCY 1)

- 1) The methodology of mindfulness
- 2) Mindfulness and the plasticity of the brain
- 3) Mindfulness and the regulation of attention and its time requirements

THE HAKOMI METHOD

Let's begin the discussion of these methods and neurological considerations by describing some basics about the particular therapeutic approach that I use: Hakomi Experiential Psychology.

This will provide the context from which I am referencing my insights.

Our work is generally oriented towards exploring emotional and somatic experiences that lead to unconscious, meaningful memory content; helping that content to become conscious; and then processing through it. From this perspective, the physical body is seen as

1. an extensive storage vault for memories, and
2. the place where experiences are experienced.

It is therefore advantageous if a client can monitor very precisely the events that can be perceived in the body, such as sensations, impulses, gestures, emotions, etc. As in many other body-oriented methods, mental deliberations or reports about past events play a lesser role than the events that can be perceived in the moment. That is the reason that the *ability to perceive* has become so important in many forms of humanistic psychology and body-centered psychotherapy. Charlotte Selver's and Fritz Perls' concept of "awareness" is a very good example of this. When Ron Kurtz developed Hakomi, he examined this issue more closely: What aspect of us perceives? Through what mechanism or process do we perceive? And which qualities need to be supported systematically by a therapist, so that the ability to perceive will be supported and refined throughout the psychotherapeutic process?

MINDFULNESS

Eventually we started applying the theories and experience from Buddhist meditation. That was not for ideological reasons, but because their body of experience around awareness is vastly superior, and much more precise, than anything in the West. Their core contention is that people can develop something in the mind that they call an "internal observer", or, sometimes, "the witness". Buddhism maintains that in this particular state of mindfulness (in Pali *sati*) one can develop a quality of self perception that is not identified with the concurrent psychic processes. This ability is trained systematically in Buddhism. (You can read more about this in Nyanaponika Thera's books, among others. A reading list is available).

The issue of the "internal observer" is particularly important to Hakomi, because our approach to transformation is based on three different models, one of which we call "disidentification".

We presume that a great part of a person's suffering originates through the identity he or she attaches to certain states of consciousness into which they enter. They become absorbed into a state which is experienced as real and true, while, in fact, it is actually a regression to an earlier, learned, and now outdated state of consciousness. By "disidentifying" with this regressive state, the client can be free both to organize around present experience as well as to develop new, more self-affirming identifications.

To facilitate this transformation, the process of becoming conscious becomes enormously important. As Moshe Feldenkrais put it, "You can only do what you want when you know what you are doing!"

(TRANSPARENCY 2)

By this I believe he means that as long as behaviors operate unconsciously, we are at their mercy. Only through awareness can we notice the following: if we are satisfied with the behavior; what we are actually doing internally that sustains the action; and what new opportunities for choice and freedom can be created. We will elaborate and clarify this notion when we later look at Alan Schore's ideas on self regulation.

A SYSTEMIC POINT OF VIEW

First we need to open up a side issue which concerns our view of the structure of the psyche.

In Hakomi Experiential Psychology, we have developed a systemic-ecological, and self-organizing understanding, of the psyche's structure. In this regard, we stand in the tradition of Roberto Assagioli, Virginia Satir, Richard Schwartz, Al Pessó, and others, who claim that the psyche, like other self-organizing systems, is made up of parts — or is organized from substructures.

The modern philosophical and scientific background for this notion can be found in the writings of Ken Wilber, Erich Jantsch, Gregory Bateson, etc. It is also a prominent component in the theory of Complex Adaptive Systems, which was developed by a great number of renowned scientists, including both Stuart Kauffman and Nobel laureate Murray Gell-Mann, who approaches the question of self-organization from the point of view of a physicist. They all agree to a basic obvious tenet: phenomenological wholes are hierarchically organized by parts.

In the intrapsychic realm, we understand those parts as manifestations of various potential states a person may assume. In practical terms, for example, a person in a quarrel differs distinctly

from the same person making love. Thoughts, feelings, sensations, the body, impulses, activated models of reality, etc., are all noticeably different in these two states. From here an understanding is brought forward that each one of us has at her or his disposal a number of typical, separate states of being which self-activate automatically in specific situations. These states are regressive in essence, because they are based on earlier experiences and the forms of self-organization that arose from them. To a degree they represent the learned response potentials towards different types of events in the world.

It is important to note that these states, or parts, of a person are clearly separated from each other, and appear almost as subpersonalities, who relate to each other in a sensitive ecology.

(TRANSPARENCY 3, added in the end)

Without defining it more clearly here, the Self, or the "I", eventually appears more like a higher-level organizational essence. We assume that individuals slip automatically from one state/part to the next, triggered by external events. They slide from one typical, pre-designed, neuronal and bodily response potential to another, identifying with each at the time. This identification causes us not only to perceive an experience, but to translate it into a statement of our being: "I am sad", "I am confused", "I am eager", etc.

BACK TO MINDFULNESS AND SELF-STUDY

When we enter a state of mindfulness, however, an internal observer arises who is not identified with the states/parts in which the person has immersed himself. In such moments, he or she can notice their experience without being fully identified with it. They will more likely describe their experiences as events, rather than as identities: "I notice that I am in a sad state"; "I observe that I am confused"; "I watch myself feeling eager".

For the past 25 years, we Hakomi Therapists have used the abilities of the Internal Observer in our psychotherapy to assist clients in two main ways:

1. To hone their ability to observe their own experiences, and
2. To develop their ability to disidentify with states that are regressive in nature.

In the course of developing the method we have adapted for use in psychotherapy the Buddhist concept of mindfulness (again, *sati* in Pali), and focused it towards everyday occurrences. The original,

classic definition of what arises through the internal observer is "pure awareness", a "witness", which is unencumbered by mental processes. Buddhist mindfulness is designed to cause, eventually, the ultimate freeing of the individual from ego-identification with the illusory material world, a state called enlightenment. For this purpose, the observer is far removed from the personality and experiences of the person, and aspires both to a state of complete, flowing, and pure observation, and to total disidentification from observable internal events.

We, in contrast, are cultivating mindfulness in such a way as to effect a change in the *locus* of identification - from experience to observer - rather than a complete detachment from experience. Mental processing of memory and other information is invited and supported. Objects of observation are held in awareness, researched, and processed. Emotions, images, impulses, etc., and bodily experiences in particular, are all felt and then studied. Consequently, this work has a resonance with the concept of reflexive ego-function in psychoanalysis.

(TRANSPARENCY 4)

This kind of mindfulness has the following characteristics:

- Attention is focused upon the internal realm.
- The observer function arises through the process of observing either the internal world *in general*, or by focusing on a *specific experience* within the internal world.
- The attitude is open, passive, and curious.
- The attitude is without bias or valuation.
- The attitude is without impulses to change or improve; if such an impulse arises, it too becomes an object of observation.
- The process of observation occurs at a pace considerably slower than regular activities in the external world.

Mindfulness is a foundational element of our work, and we promote its presence quite systematically. We pay close attention to the states of consciousness of our clients; we employ specific interventions and procedures of interaction that implement and exploit mindfulness; and we provide implicit as well as explicit training of mindfulness.

From all this, the study of self-organization emerges. The internal observer begins to register and study the patterns of automatic self-organization, such as a reaction towards words or actions that the therapist deliberately offers experimentally to trigger and explore regressive states/parts. For example, after a therapist has prepared her client to evoke the internal observer, she may say to him a statement like: "It is perfectly safe here". The client then observes how he reacts automatically to this input. In this example, one possibility might be to feel alarmed, with body contraction, fear, intense chains of thought, etc., while another might be to feel relief, to relax his shoulders and see an image of a pleasant meadow.

EXPERIMENT

I would like to demonstrate this way of working to you. With your permission, let's do just such a little verbal experiment while you're in a state of mindfulness.

(Experiment: "It is beautiful that you exist".)

NEUROPLASTICITY

So much for your own experiences with working in mindfulness.

If we now add considerations from neuropsychology, we arrive at some very interesting points. Let us start with discoveries regarding neuroplasticity, which includes the brain's ability to change its actual structure. Many of you may know that this theory was brought forward by Eric Kandel, who won the Nobel Prize for his brain research a few years ago, and whom I would like to quote here:

(TRANSPARENCY 5)

"Even during simple social experiences, for instance two people in a conversation, the activity of the neural machinery in the brain of one person has the ability to exert direct and long-lasting effects on the brain of the other".

The research shows that experiences actually rebuild and remodel the brain continuously as we have the experiences. Experiences therefore have a direct influence on the creation of individual brain architecture. Consequently, we must view the brain not as some fixed object, but as a life-long construction site. Neurons are in a permanent process of reconnecting and rewiring depending on their use. The intensity of synaptic links and pathways are strengthened when they are used often, and they deteriorate when hardly used at all.

From this we can make a preliminary hypothesis: changes and personal transformation are shaped not only by insights which happen relatively quickly, nor by one-time experiences, but by the repetition of experiences. Many important changes, in fact, can only be brought about by repeated experiences and exercise. Specific skills of the brain, like mindfulness, can possibly be supported by actually training them, just like you can train your musculature. As some of you may know, Marsha Linehan has introduced just that - training mindfulness — into Behavior Modification.

Psychoanalysts and brain experts Hinderk Emrich and Marianne Leutzinger-Boleber even claim that from their point of view short term therapies are not likely to change psychic structures fundamentally, specifically because of the time and repetition needed for restructuring the neuroanatomic processes.

TRAINING

To foster mindfulness, the internal observer, and disidentification, psychotherapy therefore does well to employ a supporting element of repetitive training, by which important changes regarding self-reflection and ego-structure can be developed.

In Hakomi Experiential Psychology this happens in two main ways: by repeatedly encouraging the presence of the internal observer in our clients; and by promoting their continual observation of [and thereby disidentification from] their various regressive states of consciousness and resulting internal events. At the same time, repeated observation of more functional states is also encouraged, along with new identification with these states. Over the course of the therapy, the work in mindfulness becomes longer and deeper. Occasionally, training mindfulness at home is recommended.

We are currently working with the University of Tuebingen on a research project on body-psychotherapy, which also includes a rating scale on the depth of mindfulness in patients. Based on first evaluations, we can cautiously predict that the state of mindfulness deepens through the practice of mindful psychotherapy, and correlates favorably with successful outcomes in the therapy.

In short, we feel that the ability to disidentify with limiting states can possibly be supported by training in and regular use of mindfulness. Additionally, one could speculate that through this process long-lasting neuronal pathways between the limbic system and the prefrontal lobes are either being created or strengthened. This notion is supported by Allan Schore's insights regarding self-regulation.

SELF-REGULATION

Mr. Schore has garnered much attention and acknowledgment for his interpretation of research regarding self-regulation, and the development of self-regulation in children as they interact with their mothers. The issue of self-regulation appears to resonate closely with the issue of identification. They interface around the question of which part of the psychic-neuronal structure creates strong links to the limbic system — to those areas where emotional and automatic responses are generated and governed, and by which identification in the psychological sense takes place.

On the physiological level, Schore's reply would be that it is the function of limbic-prefrontal connectors, which are first generated by the mother as an "external interactive regulator". The child then slowly learns to take over the execution of these structures in the process of interacting with her. Schore explains that the prefrontal brain of the child learns to replicate this important function which helps regulate impulses stemming from the limbic areas. On a more psychological level, he calls this process *self-regulation*, using an understanding of the self from the Kohut tradition.

I see great similarities between Schore's "self" and the disidentified, self-reflexive observer. At the very least I assume that the prefrontal cortex has a substantial contribution towards the internal observer, for it is generally associated with conscious human experiences, and through its limbic connectors, pays continual attention to their messages.

Let's summarize: The fact of neuroplasticity stimulates a discussion about whether certain psychologically relevant pathways and activation patterns might be deliberately trained. Schore's interest turns towards the regulation of automatic and unconscious states. Regarding mindfulness, we are also interested in the ability to become conscious and disidentified, in which process the prefrontal cortex can be expected to play a significant role as well.

ATTENTION

The second issue that I would like to address is the control of what Francis Crick, another Nobel laureate, calls the "attention searchlight" (Gerhard Roth, 2001). The ability to focus attention is an essential skill required by our clients in order to observe their self-organization in mindfulness.

As described earlier, Hakomi therapists effort to support their patients in staying with a certain experience for an extended period

of time; for instance, with an unpleasant sensation somewhere in the body. We call this "staying with", or "keepening".

Michael Posner (from Roth's book as well) describes two attention networks, the anterior and the posterior.

(TRANSPARENCY 6)

The *posterior attention network* is made up of the pulvinary, the colliculi superiores, and the parietal cortex. Except for the parietal cortex, it is located in deeper, unconscious regions of the brain. As far as it is possible to speculate at this point, it appears automatic and flexible, operating something like a conversation that flows loosely from one point to another.

In contrast, the *anterior attention network* is thought to reside in the prefrontal cortex (possibly just like many of the regulatory functions described by Schore, or like the internal observer, etc.), and allows a more controlled and focused attention.

In our work, we believe that by using mindfulness we can specifically strengthen this focusing role of the anterior attention network in its interplay with other areas of the brain (for instance the waking centers in the brainstem). By doing this, it may be possible to keep certain patterns of neuronal activation stimulated for lengthier periods of time. For example, important regions in the hippocampus and other related areas that are responsible for memory recollection may stay stimulated longer, and so have time to call up deeper contextual associations.

EXAMPLE

I would like to give you an example. Several months ago, while demonstrating this work at a university, I worked with a psychology student in front of a group. This student was quite a cerebral fellow, very factual in his manner, with very little emotional expression. He had noticed — and this made him curious — that his right shoulder hung quite a bit higher than his left. I demonstrated a body intervention with his right shoulder where I — as we call it — "took over" this mobilization. The details of this intervention are not important at this point, other than to say that I led him into a state of mindfulness and began a small, careful intervention lifting his shoulder. I waited and then asked the student whether he could notice any internal events. He said, "no ... nothing....." Well, that can become quite embarrassing when you are trying to demonstrate something novel at a university...

Here I would like to interrupt this little scene for a moment and reflect upon how I saw the situation. I am sure that left to his own devices, this student would have followed his usual automatic path of attention. Maybe he would have stepped out of the state of mindfulness, and followed a string of thoughts. He might have come up with a few associations, a few deliberations, or perhaps nothing at all.

As a therapist, I began to wonder whether in this situation it was mostly his *posterior* attention network that was activated, causing him to wander within his experience, rather than to focus. Or whether his verbal ego functions might have a weak connection to the limbic system.

I pondered that I could take over what Allan Schore calls the role of the "external interactive regulator". What if I were to support the anterior attention network, and keep this fellow in mindfulness and in observation of internal events. My prediction was that with the changes brought about in his associated neuronal networks which were triggered by my intervention, he would be able to call up the much deeper associated pathway patterns which he normally skipped automatically. (In this context Allan Schore also has an interesting model that is based on the interaction of the two hemispheres.)

Back to the demonstration: I wait and wait. I give a few encouragement's for him to keep monitoring inside events. I speculate that the attention searchlight is lingering on the associated neuronal networks, and that large areas of the limbic system, of the hippocampus, and its networked areas, begin to be stimulated. Anyway, it will be wonderful when someday somebody researches precisely what goes on in the brain, because....

... finally, after maybe one or two minutes, I see it: clearly, signs of sadness spreading over the student's face. I address him: "Something is happening now, hmm...?" And he begins to talk about a subtle, yet very deep sadness within. By staying deeply focused on his inner world, the emotional level of experience had appeared. If we had stayed with that experience longer, perhaps connections to meaning would have emerged as well.

I am going to ignore for now the issue of how his shoulder was participating in the management of his sadness. In this context, the important fact is that with the help of an external interactive regulator - a psychotherapist - one can learn to hold the attention searchlight at a specific place and for a period of time. This in turn suggests an incredibly useful application of these findings. As this path is taken more often, the brain will learn to activate and stay

with the anterior attention network in such situations. Doors will then be opened for associated contents of specific psychic-neuronal areas. These are not the pathways that are traveled in everyday life. By waiting and focusing, areas of the implicit memory that usually are being skipped at normal everyday speed now become available for experience and examination.

RESEARCH REGARDING ATTENTION

These assertions can also be linked to other data uncovered by neurological research.

Daniel Schacter, for instance, describes two forms of memory: the explicit memory, which is the declarative, conceptual, autobiographic one; and the implicit memory, which is thought to be the procedural or perceptual memory, and which is not structured in language or images, but rather by the sensory system. It's content is stored in the limbic system, in the deeper brain structures, and are not easily accessible, according to Schacter, by conscious attention processes.

Antonio Damasio, in describing his findings, calls the linkage of affects and bodily sensations "somatic markers". The shoulder of our psychology student would be an example. It would seem that the attention of the anterior network directed towards the shoulder activates other neuronal patterns connected to it, which are usually dormant within the implicit memory. These seem to show up only after somebody has learned to regulate their attention process.

As such an attention process unfolds we will possibly find that specific cell assemblies are being activated, which in turn become accessible for change. According to Gerhard Roth such an activation is the *prerequisite* for change. We believe that the attention searchlight is creating such an activation.

At the same time, neurobiologists Peter Henningsen and Ernst Pöppel point out that chaotic input of non-regulated attention can be avoided. Mindfulness and slowness can therefore be means by which certain areas of the implicit memory can be accessed and activated. In this context, psychoanalyst Fred Levin makes a case for reducing objects of attention consciously, and to slow down the therapeutic process.

POSSIBLE CHANGES THROUGH THE PROCESS OF MINDFULNESS

What can we learn from these deliberations regarding mindfulness?

If we adopt the above hypotheses, mindfulness will create the following changes:

(TRANSPARENCY 7)

- a) Strengthening of the neuronal links between the limbic system and the prefrontal cortex.
- b) Increased potential for self observation and self regulation.
- c) Development of an internal observer who is not identified with the activated substructures.
- e) Enhanced potential to activate implicit memory content, and bring it into consciousness.

Body-psychotherapy is uniquely suited to work with this mindfulness, because it uses the body as an object of observation. This process nurtures the development of the observer, and opens pathways to the implicit memory.

Moreover, within the framework of mindful psychotherapy it is appropriate to enter and explore regressive states because the internal observer is supporting the emergence of a non-identified self during the course of the work. According to this perspective, identification shifts from an internal event (sadness for instance) to the observer. Ego-functions then start to gather around this core, and patients can find non-dissociative distance from emotionally burdened substructures (or parts, as I have called them).

Experiencing regression in a disidentified mindful state makes this process completely safe, and discharges the concern about the so-called "kindling"-effect, a grinding-in process of neuronal pathways by which dysfunctional states are constantly reconfirmed and deepened, instead of being changed. This phenomenon has been widely discussed in the context of trauma.

From the point of view of Hakomi Experiential Psychology, a healthy Self has good relationships to all its component parts. It knows these substructures well, and can work with them. At the same time, it is not excessively identified with them, or can step out of identification with them fairly easily.

All of this has been facilitated by our willingness to adapt very precise knowledge stemming from the East, and to combine it with fascinating research done in the neurological laboratories. This dialogue has just begun. At this point, the viewpoints presented are valid mostly as stimulation for discussion, and not yet to considered

as unquestioned knowledge. But research has embarked upon this path and started to develop perspectives that could possibly, one day, support ancient and intuitive understanding of healing and maturation.

Thank you.

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