

My name is Dan Siegel, and it's a pleasure to speak to you about what mindfulness means for teachers and others who care for children. You know the word mindfulness is a word in common English we use for being intentional and being caring and conscientious. But the word mindful and what it means to be mindful is also related to a way we train ourselves to live openly in the present moment. This practice is found in all sorts of medical approaches now, clinical approaches, it's been found in all sorts of cultures and different cultural practices throughout the world. So really mindfulness is a human experience. Now my background is trained as a biologist and then in medicine and then studying pediatrics and moving to psychiatry. So, immersed in the science I became very fascinated with this whole notion of mindfulness after the decade of the brain and that was in the 1990's when we were learning how the brain relates to mental experience like how we are aware of ourselves and others, how we can pay attention with focus, how we can balance our emotions, how we can actually act in more ways. All of these mental experiences have correlates with brain activity and even brain structure. So when we speak about ways in which we want the mind to work with the brain, we now have the information about how we can make the brain stronger.

So the overall thing I'd like to offer as start this journey together is that mindfulness is the way of using your mind to actually integrate your brain. Now you may say, well Dan what does that mean to integrate your brain, what is that really all about? And what we know is that integration which is defined as different parts becoming linked together is the foundation for a number of things that for you might be very helpful for not only your professional life of what you want to give for children's development but even for your own development. So an integrated brain one that has the different part that link to each other can basically balance emotions more readily, so you have a sense of, it's called the equanimity in the face of challenge

you can reach emotional balance. In many ways this emotional balance that comes from integration is the source of resilience so that when we are confronted with a challenging experience as we are in day-to-day life and the world the way it is we need to develop resilience and to do that you want to integrate your brain. We also can see integration happening along ways that we use the higher parts of our brain to go more deeply into the lower parts and even parts of the body. People who are integrating like that have a way of taking the wisdom of the body, the processes that go on in the heart and the intestines and actually incorporating them in the intellectual parts of the higher regions of the brain so that you have a more complete child or what you might call a whole brain child. Now the developing mind is affected by how the brain works, so I think it's helpful to say a few things about how the brain develops and then look specifically at how does developing mindfulness for yourself actually help you develop a more integrated brain, and then how does it help you support the development of integration in the child's brain.

Let's begin with a hand model of the brain that I'd like to use in a book called The Developing Mind which gives you kind of the science of all this stuff and then in the different practical applications of that you could use this hand model even in your daily life because as my adolescent daughter doesn't want me to say it's a very handy model. So if you take your hand and put your thumb in the middle and then roll your finger on top of the thumb, this should be a very conveniently structured model of the brain which would be in your head like this and this brain has a higher part called the cortex. You lift up your fingers, a middle part called the limbic area. You lift up your thumb you get two thumbs to be a perfect model, left and right limbic area just like there's a left and right cortex. If you lift up your thumb now you come down to the brain stem. I'm going to mention very briefly what these three areas would do because these

areas of the brain up in your head coordinate with what goes on in the body that comes through the spinal cord representing your wrist and also the tenth cranial nerve called the vagus nerve.

So these passage ways that allow information to come up from the body and even down from the brain to the body are very important to helping develop a whole brain way of living. So even though when we use the word brain we're talking about the whole nervous system and as you'll see we're not just talking about the nervous system, we're talking about the way in which the brain allows us to be profoundly social creatures.

Let's take a look at how this brain develops and what a child that's in preschool experiences or elementary school, middle school or high school. So if you take this hand model of the brain, the first thing developmental that we say is that the deepest parts of the brain developed first in utero, in the womb. So the brain stem is pretty much fully formed at the time of birth and this is important for regulating the body's organs like the heart, the lungs, the intestines and determining whether you awake or asleep. This is the part of the brain the ancient reptilian brain about 300 million years in evolutionary age that mediates the fight, flight, freeze and faint response to threat. So if you have yourself in a situation where you feel threatened, the brain stem gets activated and if you have a child that feels threatened because kids are bullying them or they're being hurt at home or they feel they can't understand the material, they may feel threatened and in all those ways the reptilian threat response to fight, flight, freeze or faint can be activated and you can do this as an example, I will not do it here but if you say no really harshly several times and then a pause and say yes very calmly and soothingly, you see the difference between this reactive state of a brain stem getting activated for fight, flight, freeze or faint versus the receptive state. Now optimal learning happens when you turn on this receptive state. You engage the social circuits of the brain and also open the brain after learning which is what you as

a teacher rely on a student to be experienced in this receptive state rather than a reactive state.

So when the baby is born, the limbic area just on top of this brain stem is about halfway formed and the limbic area will be very responsive to experiences that happens outside the womb and what you see in this limbic area then it's about halfway formed and it'll be shaped in large part by both genetics which determine how these neurons are connected to each other in the womb and experience. The thing to remember is that neurons which [0:07:50] there's one phase we hear from Carla Shatz who is basically paraphrasing Donald Tebb, but what I would like to say is, where attention goes neural firing flows and neural connection grows and what that says is that how you as an adult or how you help children focus their attention [0:08:13] energy and information flow, in this case we're talking about the limbic area and how you get energy to flow through these regions of the brain basically is through attention and when you do that you can activate the firing of those neurons and the amazing thing is when neurons then fire in a focused way they wire together through connections called synapses, you can even grow new neurons, you can even lay down something called myelin which makes the effective communication among these neurons three thousand times more efficient and balance and coordinated. You can even change the regulatory molecules, these epigenetic non-DNA molecules that determine gene expression and this an amazing time then where we know these four ways, you as a teacher can optimize brain development, neuronal growth, synapse modulation, myelin formation and epigenetic control. So these are the ways that we as teachers, we as parents facilitate a growth of the development of the brain of the child or the adolescent.