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A QuickStart Guide: Keys to Changing the Brain

with Daniel Siegel, MD; Ruth Buczynski, PhD; Ron Siegel, PsyD; and Kelly McGonigal, PhD

A New View of the Adolescent Mind

The teenage brain goes through many changes. But when we think of a teenager, we often have a certain timeframe in mind. Here, Daniel Siegel tells us why we should rethinking that and gives a framework for when brain change really occurs in adolescence.

Dr. D. Siegel: "The word *teenage* usually refers to 13 through 19. But we are talking about the adolescent mind, which is a period of adolescence that extends beyond the teenage years – so really we're thinking about the second dozen years of life – 12 to 24.

The *teenage brain* idea is, in fact, that the major changes that begin during the teenage years continue into our mid-twenties" *(on p. 3 in the Part 1 Transcript).*

The Source of Risky Behavior

If you've ever classified teenage behavior as too irresponsible or impulsive, brain science might hold new insight. And here, Daniel Siegel gives us a different way of looking at *immaturity*.

Dr. D. Siegel: "You have to have changes in the brain that shift and tell this individual moving from childhood to the adolescent transformation period – not immaturity but necessary transformation – 'Risks are not only something I am willing to take, they are something I am compelled to take.'

That is what is going to allow this individual to do two things: leave the home and, for our species as a whole, try out new ways of living.

As the ever-changing world is emerging, you can now have this situation where the adolescent is able to adapt and move out to all corners of the planet.

Instead of the adult ways where we have become familiar with what we had to deal with or learned to deal with, now adolescents are at an open state – taking risks, trying out new things, creatively exploring, and driven with passion as they go out to try to populate the world" *(on p. 6-7 in the Part 1 Transcript).*

Why Sleep is So Important for the Teenage Brain

There's one thing that teenagers are often *guilty* of: they sleep a lot. And while it once may have been assumed that they were lazy, or maybe even depressed, we're finding out that sleep may be especially essential for their brain development.

Dr. D. Siegel: "Adolescents stay up later, they need to sleep longer, and schools don't respect that, and so we are having a lot of adolescents whose natural sleep rhythm change is not taken into account.

These kids are profoundly sleep-deprived, and sleep deprivation, as you know, directly impairs neural functioning. Your ability to remember what you learned, your ability to pay attention, even your ability to stay awake is impaired.

Sleep deprivation affects insulin processing, so there's a tendency to gain weight and the likelihood of diabetes is massively increased. The ability to fight off stress and disease is reduced because the immune system isn't functioning well.

Both the change in sleep timing and the amount of homework they generally have – plus all the digital things that stimulate the brain and keep the brain up long after it should have been going to sleep – are problems for the adolescent.

In all these ways, the basic physiological processes mediated by the brain stem are hugely challenging for an adolescent" *(on p. 8-9 in the Part 1 Transcript).*

How the 5 Functions of the Limbic System Change During Adolescence

Throughout adolescence, the brain changes in many ways. Here, Daniel Siegel explains 5 major limbi functions in particular that change, and how they impact the adolescent mind.

Dr. D. Siegel: "There are five major functions of the limbic area:

One is generating emotion by working with the brain stem and the body itself – that is the subcortical origin of emotion.

We know that for the adolescent brain, emotions are pushing much more up into the cortex, the higher part of the brain where you reason, than they were in childhood.

The next function is motivation. The brain stem and the limbic area are the two areas that work together to motivate us.

Motivation shifts in adolescence. Sometimes middle school and high school experiences are not that motivating for kids, but they can be motivated to do all sorts of other things.

The number three function is called appraisal, and it is very important.

Appraisal is basically your limbic area filtering both stimuli from the outside world and stimuli from the inside world: thoughts being the

example of the inside world and perceptions from the outside world.

Number four is memory. As we said, sleep deprivation makes it hard to remember. The hippocampus is in this region, and stress decreases hippocampal functioning.

The fifth function of the limbic area that also changes and is challenged during adolescence is attachment" *(on p. 9-10 in the Part 1 Transcript).*

How Our Needs Change as Our Brain Changes

No matter our age, we generally need the same basic things out of life, shelter or a feeling of security, for example. But here, Daniel Siegel explains how we attain those needs changes as we go through adolescence.

Dr. D. Siegel: "Attachment, in the simplest way, is how we, as mammals, need an attachment figure to give us four S components. We are seen by the attachment figure; we are safe with the attachment figure; we are soothed by the attachment figure; and we feel secure with the attachment figure.

All these S features – seen, safe, soothed, and secure – we have with our parents when we are children, infants, toddlers, elementary-school-age kids, but then the limbic area changes.

So, this is the attachment aspect of limbic functioning, and it changes during adolescence such that, instead of turning to our parents, we turn to our peers. I call this social engagement.

Social engagement is essential for the adolescent's adaptation. If you leave the nest and go out into the wider world without an adolescent support group in the wild, you are as good as dead.

Social engagement is not just about caving under peer pressure; it is an evolutionarily created push, driven by the limbic area, to have membership with your adolescent group so that you don't die" *(on p. 11 in the Part 1 Transcript).*

Is it Irrational Thinking, or Brain Change?

It can often seem like teenagers don't think things through or recognize the risks they take. But according to Daniel Siegel, it goes beyond being uninformed about the dangers of their choices. Here, he explains what is actually happening in their brain when they make certain decisions.

Dr. D. Siegel: "Unlike what many parents think – that adolescents are just not informed about danger – research shows that, in fact, they usually do know about the danger.

In fact, in some situations, they overestimate the likelihood of danger but they carry out the behavior anyway – which is totally confusing.

Why is that? The limbic area is skewed to minimize concern about the dangers and maximize/hyper-emphasize the pros.

Now, here's a hyperrational thinking example. Supposing I'm an adolescent and you say to me, 'Dan, here's a gun. I'm going to give you one bullet, six chambers; I want you to spin it around. I want you to shoot it at your head. What is the most likely thing that will happen and what will you do?'

Now, obviously this is an extreme, but just to give you a feeling for what hyperrational thinking is all about, I'd say, 'Why would I do this?'

You say, 'I'll give you six million dollars.' I go, 'Oh, wow. That's a pretty cool gift. Thank you. Let's see. If a hundred of me did it five-sixths of the time – that would work out fine – right?'

'Five-sixths compared to a sixth is a majority of the time – five-sixths of six million is five million dollars so the likelihood of a hundred of me doing it is the likelihood that I'll get five million dollars. That's the average for every person doing it. And since it's the most likely thing to do, I think I'll do it!'

Now, that is hyperrational thinking. When you de-emphasize the downside, of course, you shoot the gun because it is true: with a

hyperrational probability calculation, the statement is saying, 'The most likely outcome is for Dan to get the money.' That's totally rational – right?

We are saying that the adolescent, limbically, is not evaluating the meaning of the downside, which is what we believe is true because that allows you to go out of the house and take risks – otherwise they would stay at home" *(on p. 16 -17 in the Part 1 Transcript).*

How Self-Awareness Can Affect Behavior

Daniel Siegel discussed the process of interoception and the impact self-awareness can have on our behavior. Here, Kelly McGonigal elaborates and gives two ways you can train interoception.

Dr. McGonigal: "Interoception is the ability to sense what is happening within the self.

That includes both what is happening physically in different systems of your body – detecting your heart rate and your breathing – but also, importantly, detecting your emotions and detecting the embodied aspect of emotions – being able to rely on gut decisions.

When Dan talked about that, I thought it was very important in terms of thinking about what is helpful to train in teenagers.

One of the ways that I like to train interoception in young adults – and I have taught this to eighteen-year-olds at Stanford University – is through the practice of yoga and the practice of learning to direct your attention to what is happening to the body from the inside out – but not using mirrors.

I'll ask: 'What does this pose feel like? What does this stretch feel like? What does your breathing feel like?'

You can use the process of attending to sensation in the body as a tool when you are trying to make decisions or make choices.

Here's one of my favorite exercises to teach younger and older people: If you are making a difficult decision or you are trying to figure out, 'What do I want in this situation?' you sit quietly, turn your attention to your body and breath, and pretend like you have made up your mind – 'The decision I am going to make is X. I am going to say yes to this. I am going to do it.'

Then, you sit and breathe, and notice what arises in the body – and you use that as information.

Then you flip it – try on the other: 'What would it feel like if I said no to this? Let's pretend that my decision is no.' You sit and use this ability to sense how the body changes in response to that decision" *(on p. 4-5 in the Part 2: TalkBack Transcript).*

How to Work with a Rebellious Teen

While it is not uncommon for teens to rebel, it is also not always apparent why they sometimes react so strongly to seemingly insignificant things. Here, Ron Siegel explains how rebellion has changed and why arguing may be exactly what a teenager needs.

Dr. R. Siegel: "It is so true that there is this biological thrust toward separation and independence from parents and it so easily leads to 'Romeo and Juliet' effects where kids are drawn to precisely the activity that their parents are saying they don't want them to do.

Now, sometimes this can be used skillfully in a way which is a little like Judo. Richard Gardner, a prolific psychiatrist out of New Jersey, wrote all sorts of books on child treatment. I once heard him talk about the brilliant innovation of long hair on boys in the 1960s.

He said it like this, 'What a great cultural event that was because here was something that was completely and utterly harmless. Kids could have intense arguments with their parents about long hair instead of the arguments of a decade earlier about driving their cars to the edge of a cliff or drinking excessively. All they had to do was not go to the barber! It was such a more benign way to play this out.'

One answer is to know that this is part of what is going on.

If your kid – or the one you are counseling, or caring for, or in some way advising – is involved in some kind of tension where you can sense that the tension may simply be about the need to differentiate – this need to pull out of the nest – then go ahead, and have a battle over something silly.

That can help to create the balance. I've seen how this can be very effective in making clear the few things that are completely non-negotiable because the consequences are completely irreversible.

Each family is going to have their own rules. The only way that works, though, is if there is 'money in the relational bank.'

I used to train clinicians about this a lot – most clinicians were reasonably well-behaved as children – but I would say, 'What did it? What made you behave more or less reasonably? Was it the hope for reward or the threat of punishment in a very tangible way?'

Usually it is not that – usually it is the sense of, or internalization of, the benign parent – there is a connection with and a feeling of, 'I don't really want to rupture the bond in my own heart and mind with that other person.'

And the way that comes is by putting money into the relational bank, drip by drip – finding empathic ways to relate to the kid, showing

understanding, playing together, doing things you enjoy together, and not having everything be about the coercion and control battles.

Once there is 'money in that bank,' then you can draw on that for the absolute. Then, you can fight all you want in colorful ways about long hair or whatever the current 'issue du jour' is" *(on p. 5-6 in the Part 2: TalkBack Transcript).*

Guiding Teens in the Right Direction

Teenagers almost seem to thrive on danger. The changes happening in their brain can often spur their need for novelty, and sometimes that can be dangerous. Here, Rick Hanson explains how we c an help them make safer decisions.

Dr. Hanson: "I think it is helpful to appreciate, obviously, that there is a lot of normal variation. I think many teenagers are quite cautious, conscientious; they worry about the future. You know, that said, certainly on the average there is the tendency toward risky behaviors. And two things struck me about that.

One is that, for all their emotionality, my own experience of working with adolescents – I have worked with quite a lot of teenagers – is that they often lack self-compassion. In other words, they are often quite good about really feeling for their friends, and they are loyal to their

friends, but they are not very compassionate for themselves.

I think to help adolescents deal with that in a more grounded way is to open the compassion for themselves, to have more of a caring attitude. Often, adolescents are harshly self-critical rather than kind to themselves.

And then the second thing is about loyalty. Adolescents tend to be very, very loyal to their particular 'peeps,' if you will, their type. Well, they can extend that same loyalty to the person they will become – the one who will be impacted by going driving with someone who is drunk or blowing off high school. And they can tap that powerful capacity for loyalty that is present in adolescence to have loyalty to the one being that they have the most power over, which is of course their future self" *(from Part 3: Next Week in Your Practice).*

How to Encourage a Teenager's Creativity

According to Daniel Siegel, the changes happening in the adolescent brain are a big part of why teenagers tend to be so creative. Here, Bill O'Hanlon elaborates on how we can help them use that creativity.

Mr. O'Hanlon: "I think that growth spurt can be channeled with these kind of risky activities. It can also be channeled in those creative

directions, and I think music and art and dance and writing are some good ways. I know that I played music when I was an adolescent – I have always listened to it but I also played it – and it was a great outlet for me. It was a really good way to connect with myself and do some of that self-awareness. And it was a way to channel that 'I'm unique and nobody understands me' kind of stuff. Because I would find, and also write, songs that would be like that.

So I think finding a creative outlet – and I know there has been some complaints in the US that we are cutting arts programs, and, to link this back to the brain, we know that learning music is a whole-brain growth experience. It is an integrative experience and a whole-brain growth experience.

So I like the music part of it – but dance obviously, because it has rhythm and music to it, typically; writing can do something like that; art can do something like that. But my favorite is music – so if you can expose kids to music – and when I, as a therapist, I have a kid come in and I say, 'Bring me in your favorite music,' and a whole different kid shows up in my office" *(from Part 3: Next Week in Your Practice).*