

Notes and summary taken from "Social Why our brains are wired to connect". Matthew D. Lieberman. Dept. of psychology, Psychiatry and biobehavioral Sciences, UCLA. 2013 Broadway Books; New York. Summary notes taken by: D.H.Clayton Ph.D. Spanish translation: Nestor Rosales, Guatemala.

Theory of Mind

"Theory of Mind" refers to the ability to understand that other people have their own thoughts that effect and determine their behavior. This theory allows us to the make sense of the minds of others and count on others to make sense of our mind and behavior. It's a foundational concept that allows us to respond in an orderly fashion based on a set of rules. Most importantly, it is a signature human achievement that allows us to coordinate our otherwise isolated thoughts with the thoughts of others to promote shared goals and cooperation. The ability to consider the reactions of those around us and to imagine those reactions in advance, allows us to increase our exposure to social rewards and minimize the experience of social pain and rejection. We use our "Theory of Mind" to read the minds of others to support our motivation for connection. When people apply this ability, it is called *mentalizing*. (When we think about the mental states of others.) Humans begin developing and demonstrating this ability in the course of their development around the age of 5. We then build on this ability the rest of our lives.

Default mode network (DMN)

The DMN is a set of regions (modules) in the brain that turn on when we are doing nothing. Instead of being at rest when we're doing nothing, we engage in social cognition. We think about other people, ourselves and our relationship with other people. The DMN is a set of brain networks that start developing within days of our birth and continue until our death. It's an automatic social processing network

that works at an unconscious level. It supports social cognition and helps us make sense of other people and ourselves.

We are constantly interested in the social world because our brains are built to turn on the default network during our free time. It turns on like a reflex. It's constantly nudging our attention to think about what other people are thinking, feeling and what their goals are. This promotes our understanding and empathy for others and leads to cooperation and consideration. It suggests that evolution, figuratively speaking, made a big bet on the importance of developing and using our social intelligence for the overall success of our species by focusing the brain's free time on it. (Betting millions of years on making us more social.) It is the cause, rather than the consequence of our interest in the social world. We have an evolved predisposition to think about the social world in our free time rather than its being merely a moment-by-moment personal choice. It is the brain's preferred way of being and one that it returns to the second it has an opportunity. Our brains are constantly priming us for effective social thinking. Theory of mind is part of our basic operating system and our ability to *mentalize* is one of the signature achievements of the human mind.

Autism

It has been demonstrated that people with autism have a relatively specific deficit in mentalizing (thinking about someone else's motivations for acting) about others and, consequently, they have difficulty connecting and sharing with others who see the same events unfold. Other mentalizing deficits that autistic people have is the ability of make sense of bluffing, irony, sarcasm, and faux pas. Is the "theory of mind" deficit a cause or a consequence of autism?

Autism & Intense world hypothesis

We have two amygdalas, one in each hemisphere of our brain. Amygdalas are small structures the shape and size of almonds whose function is to respond to and code for the emotional intensity of events in the environment...especially social events like people's emotional expressions, in particular, negative emotional experiences like fear and anxiety (even at subliminal levels). For example, when adults with and without autism were asked to look at faces expressing emotions like anger and fear, the autistic individual's amygdala didn't react nearly as strongly as non-autistic adults. But children with autism are born with larger amygdalas than typically developing children. (Children as young as four and as old as twelve). The larger the amygdala, the greater the response, i.e., anxiety. This may mean that autistic children are overwhelmed by their environment. They have an enhanced threat detection...sound, touch and visual inputs. When tracking the eye movements of autistic children looking at pictures of faces, they tend to look randomly around the face, where as normal children focus primarily on the eyes and mouth. As a result, the autistic person doesn't look at the emotional indicators on the face that typically activate the amygdala. When they do look at the eyes and mouths, their amygdalas' activation was greater than non-autistic children. If autistic children do not know where to find the areas of the face showing emotion, they may not learn to attend to sources of emotional information on other children's faces because it's too distressing. If this coping strategy continues into adulthood, the autistic adult may avoid looking at eyes and mouths so they won't become distressed and, consequently, they become less responsive socially. In other words, the autistic person's aversion to the social world becomes a coping mechanism for dealing with the most intense

and unpredictable part of their world-other people. Their avoidance causes them to miss out on the countless opportunities to strengthen their mentalizing abilities (thinking about what's motivating others) during critical periods of brain development. They don't learn empathy and, as a result, they don't know what others are experiencing nor what kind of help or comfort is needed and, therefore, don't have the prosocial motivation to act on behalf of others. They don't develop the mental machinery that facilitates connectedness with others and don't learn to connect with others to form thoughtful and enduring relationships among friends and loved ones.

Seeing yourself and knowing yourself

Recognizing ourselves in a mirror, photograph or video doesn't mean that we, therefore, know ourselves. Seeing ourselves and knowing ourselves, through self-reflection, are two different mental phenomena that use different modules and circuits (systems) in our brains. The system for thinking about our own minds and the system for recognizing our bodies are separated in our brains. The brain system that we use to develop our sense of who we are (sense-of-self), contrary to popular belief, is not hidden away from others and only accessible to us. For those among us who have learned to mentalize well, we've learned that we can reasonably speculate about others and their "sense of self" and, in time, learn to predict their behavior and thoughts with a certain amount of accuracy. Surprisingly, this ability may actually hide how we've evolved to successfully operate in our social lives. The question becomes: does the "self" really function as a conduit for us to better connect with our various social groups in a way that helps us supplement our natural impulses with socially derived impulses? This allows us to take advantage of the collective social wisdom and, thereby, fosters a better adaptation for us towards harmonious collective living. This whole process is taking place at an

unconscious level while our conscious awareness may still be operating as if we are all unconnected islands. (This may be true of western cultures more so than eastern). In truth, our brains have evolved to use those outside forces to construct and update our "self". We look to others, knowingly or unknowingly, to find out who we are. We listen not only to their words about who they think we are, but more so, we attend to their nonverbal behavior and communications, including their tone of voice. In other words, we are especially tuned into their "meta-communications" (communications about communications) where we learn how they really feel about us. For example, someone says to us: "Oh, how nice it is to see you again". They say this while their head minutely and hesitatingly shakes "no".

We may be, unknowingly, more focused on the minds of others than on our own inward thoughts when it comes to thinking about the "self". Our self-knowledge is constructed from outside sources. We seem to want to know what others believe about us and then use it as a representation for what we think we should believe about ourselves. Again, we have successfully evolved to find safety in the group's value and their inclusion of us.

Social well-being

A large portion of our brains are wired and devoted to making us more social and keeping us connected. We are constantly checking on and thinking about our social connections and we feel pain when our connections are threatened. Our sense of self is closely aligned with the groups that we identify with. And, increasingly so, society considers our social preoccupations to be distractions from focusing on the most important task at hand: making money to improve our well-being. But research indicates that money doesn't necessarily lead to more happiness. (e.g., people who win the lotto)

Once our basic needs have been met, more money adds only a small percentage towards a sense of well-being. How, in a society like the U. S., where well-being has declined over the last two decades, did we get this so wrong? What will really make us happy? Pursuing happiness has gotten confused with making more money and with getting promoted on our jobs. Money, in most societies, is considered a positive life value, despite the fact that it seems to make us less happy.

To rebuild a social structure that leads to overall well-being, we need to consider promoting social connectedness and social bonds. Most organizations don't get "social" right. "Pay for performance" is not enough to improve productivity. New research suggests that acceptance and connecting motivate people to work harder for the group(s) they identify with, which could include the organization they work for. Human capital is the amount of intelligence, experience, and education a person has. It's not just human capital that makes us more productive. Social capital is even more important. Without social connectedness to others in organizations and societies, full productivity is not realized. Perceived "fairness" in an organization can account for a 20% increase in productivity because fairness activates the same reward circuitry in the brain as does money. When you add to that: status, feeling valued, plus the opportunity to help others, you have maximized the conditions for productivity. When our work helps others, we feel we are doing something meaningful. When our work makes us feel good, it activates the brain's reward circuits. As a result, we are more likely to feel positive towards the organization that gave us the opportunity to generate those good feelings.

Effective corporate leadership requires social skills and is considered twice as important as competency in leadership. Unfortunately, leaders are usually not chosen because of their social skills. Intelligence, dominance and masculinity have been considered the

most important leadership attributes. In one study, intelligence and empathy were negatively correlated with one another.

Educating the social brain

Middle school students (11-14 y/o) begin losing interest in school and their grades begin to decline. To counter this, we need to address students' social/developmental needs. Instead of more testing and report cards, which have not increased real learning, educators should focus more on the what middle school students' social brains need. They don't feel connected to their schools or their communities. At this age a child's greatest need is to feel they are liked and have a sense of belonging. But, does feeling connected improve learning and educational outcomes in general? Being bullied decreases grade point average and school attendance. Schools with higher bullying rates scored lower on tests of algebra, geometry, earth science, biology and world history. The reason may lie in the same neural circuitry that conveys physical pain also conveys social pain which has very clearly shown to lead to reductions in test performance. (From 82% to 69%). On the other hand, first year college students who went from feeling they didn't belong, to feeling they did, earned higher grades throughout the rest of their college years. This was particularly true for African-American students whose grade point average increased an average of 0.2 units (i.e., GPA of 3.6 instead of 3.4) in nearly every semester for the rest of their college years. Three years after spending just one hour in a psychology experiment, these students' academic performance continued to improve, along with their sense of belonging. This translates to increased dopamine levels being released from the ventral tegmental area of the brainstem as well as the lateral prefrontal cortex. Increasing dopamine can improve working memory. In other words, increased dopamine levels lead to higher grades.

Our brains have evolved to attend to our social worlds. The better we understand our social environments, the better our lives become. The mentalizing system that promotes this understanding is *particularly active during adolescents*. Why do high school educators emphasize learning information that will be forgotten in just a few years? What adolescents want to learn is about their social world, in particular, how it works so they can maximize their social rewards and minimize their social pain and rejection. Adolescents enter their classrooms hungry for social learning. To learn math, science, geography, etc., the lateral prefrontal and parietal regions involved in working memory and reasoning, along with the hippocampus and medial temporal lobes, need to be engaged. In contrast, the mentalizing system tends to operate in opposition. Yet, it also has a memory system that is potentially more powerful than the traditional learning network. If we can better craft our learning assignments to emphasize understanding the social dynamics, rather than the information itself, a better memory of the overall information they are learning will be remembered. Emphasizing understanding the information socially rather than just memorizing it, leads to better overall recall of the information. This means that mentalizing isn't just for social learning, it's a powerful memory system which is underutilized in classroom learning. When the traditional memory system is operating, the mentalizing system is turned off and traditionally our education system is designed to prevent it from functioning. In fact, mentalizing in the classroom is often punished. The soap opera of history, as it unfolds, makes it very socially interesting to us and engages our mentalizing system with its powerful memory capacity. **Why** history unfolds in the way it does is far more interesting to us than *how* it unfolds. We'll remember an historical movie drama much better than reading a book on the facts of the same history. This is also true in learning English or

Spanish. In math and science, the mentalizing system can be engaged simply by telling the students that, when they learn the material, they should learn it in so they can teach it to others-(learning-for-teaching.) When students are told to learn the material in order to take a test, they didn't do as well as the group that were motivated to learn for the purpose of teaching. The material that the learning-for-teaching group learned had no social component other than the social motivation to teach others. Social motivation may alone be sufficient to activate the mentalizing system's memory abilities. Students-teaching-students might be a better learning strategy than learning just for yourself and taking a test. What if we made the lower achieving students the teachers? Low achieving 8th graders teaching 6th graders math. If when 8th graders learn the material, they expect to teach the 6th graders, they will more likely engage their mentalizing system to boost the quality of their memory for the material.

Educating for savvy social skills

During adolescence, neural and hormonal changes make the brain ever so ready to learn effective social skills. Effective social skills are very important in almost every aspect of living, including managing successful careers. Working effectively with team members, superiors, subordinates is important for adult life success. Because we are usually on our own in developing our social skills, we don't learn all we need to learn and are susceptible to social cognitive and self-processing errors: biases, fundamental attribution errors, consensus effects, affective forecasting errors, group favoritism and overconfidence. Who is so lucky to have our errors pointed out to us as we transverse adolescents? Teaching students how to identify these errors, while not eliminating all of them, can help provide a shared language for discussing and considering these errors when they occur. We also need to understand that when others make these mistakes, they aren't

necessarily being mean or nasty or intentionally self-serving. No one tries to be a jerk. If we all had a more mature understanding of how these social errors happen and the motivations of others when they make errors, we could learn how to stop these errors and minimize the consequences that come from being misunderstood. We should be teaching our adolescents about their social motivations and how hurting someone else's feelings is more like a physical attack than we might believe. We have both selfish and prosocial motivations and gravitating towards connecting with others isn't a sign of weakness. The developing social brain needs accurate information about the social world. There is way too much misinformation in the adolescents' world taken from "face book" and uninformed peer opinions. We need to be teaching our children how to be socially savvy adults and that's exactly what the adolescents' brain craves. After all, there is a science of how the social world works: social psychology, social neuroscience and sociology teaches us all about the social brain. We should be using it to teach our students how to be effective social people, in the classroom and everywhere else our social lives take us.

Contrary to popular opinion, human brains are not like computers with a fixed operating system and a hard drive that needs to be filled with ever-increasing amounts of new data. Neuroscientists have helped change that view of the human brain. We now know that the human brain is far more flexible than we thought. We used to think that by the time we reached adulthood, we stop generating new brain cells and we're left with a fixed amount until, in old age, we start losing brain cells. Now we know that new brain cells can be born in adulthood through exercise, among other ways. We are just now beginning to research how the brain increases working memory through training. Training our brains to improve our working memory can change both working memory and fluid intelligence. (Being able to think and reason

abstractly and solve problems.)

What about training our social brains so we can get better at mentalizing, empathizing and developing self-control? That would be a good thing for our society, right? How about brain exercises in exercise class that help us improve our ability to better read the minds of others and to be more self-reflective...be more aware of how others see and hear us? During adolescence emotionality peaks but we don't learn to regulate our emotions until our mid-20s. That's what makes adolescents likely to make mistakes and bad decisions that can lead to delinquency, addiction, pregnancy and dropping out of school. Maybe in a social brain exercising class we could learn to change those tendencies and students could learn better psychological strategies for staying focused in class, doing their homework and studying for tests. When we learn to delay gratification and regulate our emotional reactions while developing new, more adaptive perspectives, we activate our prefrontal cortex (right ventrolateral). Mindfulness meditation may help the development of, not only self-control, but, at the same time, emotional regulation. There seems to be a connection between the two and it always involves the prefrontal cortex.

By changing the curriculum in middle schools and emphasizing social skills like mentalizing, empathizing, cooperating, and fairness, we can help students maximize their potential as social beings and be much more inclined to promote social connectedness, in an ever increasingly diversified world.