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Can Neuroscience Help Us Disciple Anyone?

Brain science and the renewal of your mind.

John Ortberg

For an article about ministry and neuroscience, it seems only right to begin with Scripture. So we start with one of the great neurological texts of the Bible: "David put his hand in his bag, and took thence a stone, and slang it, and smote the Philistine in his forehead, that the stone sunk into his forehead; and he fell upon his face to the earth" (1 Sam. 17:49, KJV).

Neuroscience has gained so much attention recently that it can seem like we're the first humans to discover a connection between the physical brain and spiritual development. But way back in Bible times, before EEGs and HMOs, people had noticed that putting a rock through someone's skull tends to inhibit their thinking.

For those of us in church leadership, information about "the neuroscience of everything" is everywhere. How much do we need to know about it? What new light does it shed on human change processes that those of us in the "transformation business" need to know? Does it cast doubt on the Christian view of persons as spiritual beings who are not merely physical?

Why is Neuroscience Exploding?

Neuroscience studies the nervous system in general and the brain in particular. Neurobiology looks at the chemistry of cells and their interactions; cognitive neuroscience looks at how the brain supports or interacts with psychological processes; something called computational neuroscience builds computer models to test theories.

Most of our behavior-typing, tying a shoe, or driving-is governed by habits imprinted on our brains. So is discipleship.

Because the mind can be directed to any topic, there can be a "neuroscience" of almost any topic. Neurotheology looks at the brain as we believe, think, and pray about God. Researcher Andrew Newberg has shown the brain-altering power of such practices as prayer by looking at changes in the brain-state of nuns engaged in the practice for over 15 years as well as Pentecostals praying in tongues. It turns out that intense practice of prayer means their brains are much more impacted by their prayer than inexperienced or casual pray-ers. To find out who the true prayer-warriors in your church are, you could hook everybody up to electrodes, but it might be a little embarrassing. Paul Bloom pointed out that we shouldn't be surprised by this; the surprising thing would be if people experience a profound state without their brains being affected.

Brain studies made steady progress through the twentieth century; my own original doctoral advisor at Fuller Seminary was Lee Travis, who pioneered the use of the electroencephalogram at the University of Iowa in the 1930s. But for a long time, no one could actually look inside a working brain to watch it in operation.

That changed in the 1990s with functional Magnetic Resonance Imaging (fMRI), which allows researchers to track the flow of oxygen-rich blood (a proxy for neuron activity) in real time. Now it became possible to find out what part of the brain is involved in any given sequence of conscious activity, and how brain functions of liberals versus conservatives or religious versus non-religious people may differ from each other. It also became possible to find out if that guy in the second row whose eyes are closed when you're preaching really does have something going on in his brain during the sermon.

Why I'm Thankful for Neuroscience

"All truth is God's truth," Augustine said, and a deep part of what it means to "exercise dominion" is to learn all we can about what God has created. And there is very little God created that is more fascinating or more relevant to our well-being than our brains.

Neuroscience has immense potential to relieve human suffering. Already neuroscientists have found ways to alleviate symptoms of Parkinsons and create cochlear implants. Our church had a baptism service recently and several of those being baptized were young adults who suffer from cognitive challenges. In each case their parents were in tears. For those of us doing ministry to be aware of advances in brain science is part of caring for those in our congregation.

Research into the teenage brain made clear that the human brain isn't really fully developed until people are well into their twenties. Previously it was thought that the teenage brain was just "an adult brain with fewer miles on it." It turns out that the frontal lobes, which are associated with choosing and decision-making as well as with impulse-control and emotional management, are not fully connected—they lack the myelin coating that allows efficient communication between one part of the brain and another.

Christians have brains and neurons that are as fallible as atheist neurons and new age neurons.

This helps explain the ancient mantra of parents and student ministry leaders everywhere: "What were you thinking?" Churches can help parents of teenagers understand why a practice as simple as insisting their teenage children get a good night's sleep is so necessary. They can also help parents set expectations for their teenagers' emotional lives at an appropriate level. They can also remind church leaders who are doing talks for teenagers to keep them short!

Neuroscience can also teach us compassion. For too long people who suffered from emotional or mental illness have been stigmatized. Churches—which should have been the safest places to offer healing and care—were sometimes among the most judgmental communities because it was assumed that if people simply got their spiritual lives together, their emotions should be fine.

Rick and Kay Warren noted after the death of their son: "Any other organ in my body can get broken and there's no shame, no stigma to it. My liver stops working, my heart stops working, my lungs stop working. Well, I'll just say, 'Hey, I've got diabetes, or a defective pancreas or whatever,' but if my brain is broken, I'm supposed to feel shame. And so a lot of people who should get help don't."

Pastors can offer great help to their congregation when we simply acknowledge the reality that followers of Jesus do not get a free pass from mental health problems. Christians have brains and neurons that are as fallible as atheist neurons and New Age neurons.

Beyond that, I'm thankful for neuroscience because it is helping us understand better how our bodies work, and that enables us better to "offer our bodies a living sacrifice to God." Knees that spend long hours in prayer change their shape. So do brains.

The Limits of Neuroscience

One of the reasons it's important for pastors to be conversant with the topic is that neuroscience is being accorded enormous authority in our day—not always for good reasons. I joke with a neuroresearcher friend of mine (who helped a lot with this article but wants to remain anonymous) that the easiest way to get an article published today is to pick any human behavior and ...

1. Show which parts of the brain are most active when thinking about that topic;
2. Explain why evolutionary psychology has shown that behavior is important to our survival;
3. Give four common-sense tips for handling that behavior better—none of which has anything to do with #1 or #2.

Precisely because neuroscience has so much prestige, those of us who teach at churches need to be aware of its limitations as well as its findings. It's one thing to say that our brain chemistry or genetic predisposition may affect our attitudes or beliefs or behaviors. It's another thing to say we are nothing but our brain chemistry.

Sometimes writers make claims in popular literature that would never make it into a peer-reviewed academic journal. One example is a recent book, *We Are Our Brains*, which makes the claim that there is no such thing as free will, that our brains predetermine everything including our moral character and our religious leanings, so there is no good reason to believe God exists either.

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People may be under the impression that "science" has proven this. This is sometimes called "nothing buttery"; the idea that we are "nothing but" our physical selves.

Yet let's be clear: we are not just our brains.

No one has ever seen a thought, or an idea, or a choice. A neuron firing is not the same thing as a thought, even though they may coincide. A brain is a thing, a human being is a person.

God doesn't have a brain, Dallas Willard used to say, and he's never missed it at all. (Dallas actually used to say that's why for God every decision is a "no-brainer," but I will not repeat that because it's too much of a groaner, even for Dallas.)

Neuroscience can help us understand moral and spiritual development. It shows the importance of genetic predispositions in areas of character and attitudes—from political orientation to sexuality. But it has not shown that personal responsibility or dependence on God are irrelevant. It does not replace the pastor or trump the Bible.

The Neuroscience of Sin And Habits

Neuroscience has shown us in concrete ways a reality of human existence that is crucial for disciples to understand in our struggle with sin. That reality is this: mostly our behavior does not consist of a series of conscious choices. Mostly, our behavior is governed by habit. Most of the time, a change of behavior requires the acquisition of new habits. Willpower and conscious decision have very little power over what we do.

A habit is a relatively permanent pattern of behavior that allows you to navigate life. The capacity for habitual behavior is indispensable. When you first learn how to type or tie a shoe or drive a car, it's hard work. So many little steps to remember. But after you learn, it becomes habitual. That means it is quite literally "in your body" (or "muscle memory"). At the level of your neural pathways. Neurologists call this process where the brain converts a sequence of actions into routine activity "chunking."

Chunking turns out to be one of the most important dynamics in terms of sin and discipleship. Following Jesus is, to a large degree, allowing the Holy Spirit to "re-chunk" my life. This is a physical description of Paul's command to the Romans: " ... but be transformed by the renewing of your mind."

Habits are enormously freeing. They are what allows my body to be driving my car while my mind is planning next week's sermon.

But sin gets into our habits. This is the tragedy of fallen human nature. Self-serving words just come out of my mouth; jealousy comes unbidden when I meet someone who leads a larger church or preaches better; chronic ingratitude bubbles up time and again; I cater to someone I perceive to be attractive or important.

Neuroscience research gives us a clearer picture (and deeper fear) of what might be called the "stickiness" of sin. It is helping us to understand more precisely, or at least more biologically, exactly what Paul meant when he talked about sin being "in our members." He was talking about human beings as embodied creatures—sin is in the habitual patterns that govern what our hands do and where our eyes look and words our mouths say. Habits are in our neural pathways. And sin gets in our habits. So sin gets in our neurons.

Like so much else, our neurons are fallen, and can't get up. They need redemption.

The Neuroscience of Discipleship

You can override a habit by willpower for a moment or two. Reach for the Bible. Worship. Pray. Sing. You feel at peace with God for a moment. But then the sinful habit reemerges.

Habits eat willpower for breakfast.

When Paul says there is nothing good in our "sinful nature," he is not talking about a good ghost inside you fighting it out with a bad ghost inside you. Paul is a brilliant student of human life who knows that evil, deceit, arrogance, greed, envy, and racism have become "second nature" to us all.

Sanctification is, among other things, the process by which God uses various means of grace to re-program our neural pathways. This is why Thomas Aquinas devoted over 70 pages of the *Summa Theologica* to the cultivation of holy habits.

It's why 12-step groups appeal, not to willpower, but to acquiring new habits through which we can receive power from God to do what willpower never could.

Neuroscience has helped to show the error of any "spirituality" that divorces our "spiritual life" from our bodies. For example, it has been shown that the brains of healthy people instructed to think about a sad event actually look a lot like the brains of depressed people.

"Spiritual growth" is not something that happens separate from our bodies and brains; it always includes changes within our bodies. Paul wrote, "I beat my body to make it my slave"—words that sound foreign to us, but in fact describe people who seek to master playing the cello or running a marathon. I seek to make the habits and appetites of my body serve my highest values, rather than me becoming a slave to my habits and appetites. What makes such growth spiritual is when it is done through the power and under the guidance of the Holy Spirit. Paul's language remains unimprovable: We offer our bodies as living sacrifices so that our minds can be renewed.

One of the great needs in churches is for pastors and congregations to experiment with discipleship pathways that address the particular context that we face. Pornography (and misguided sexuality in general) has always rewired the brain. But now porn is so incredibly accessible that men and women can be exposed to it any time they want for as long as they want as privately as they want. Each time that connection between explicit images and sexual gratification is established, the neural pathway between the two grows deeper—like tires making ever-deepening ruts in a road.

Simply hearing that sexual sin is bad, or hearing correct theological information, does not rewire those pathways. What is required is a new set of habits, which will surely include confession and repentance and fellowship and accountability and the reading of Scripture, through which God can create new and deeper pathways that become the new "second nature," the "new creation."

At our church not long ago, one of our members spoke openly about many years of shame around sexual addiction. His courageous openness stilled the congregation, and it led to the formation of a recovery ministry that is one of the most vibrant in our church.

The Neuroscience of Virtue

Kent Dunnington has written a wonderfully helpful book, *Addiction and Virtue*. He notes that many federal health institutes and professional organizations assume addiction is a "brain disease" purely "because the abuse of drugs leads to changes in the structure and function of the brain." However, playing the cello and studying for a London taxi license and memorizing the Old Testament also lead to changes in the structure and function of the brain. Shall we call them diseases, too?

Dunnington says that addiction is neither simply a physical disease nor a weakness of the will; that to understand it correctly, we need to resurrect an old spiritual category: habit. We have habits because we are embodied creatures; most of our behaviors are not under our conscious control. That's a great gift from God—if we had to concentrate on brushing our teeth or tying our shoes every time we did that, life would be impossible.

But sin has gotten into our habits, into our bodies, including our neurons.

Partly, we may be pre-disposed to this.

For example, people with a version of the Monoamine oxidase A (MOA) gene that creates less of the enzyme tend to have more troubles with anger and impulse control. (If you have that version of MOA, you're feeling a little testy right now.) This means that when Paul says "In your anger, do not sin," some people are predisposed to struggle with this more than others.

That doesn't mean that such people are robots or victims or not responsible for their behavior. It does explain part of why Jesus tells us to "Judge not"; none of us knows the genetic material that any other person is blessed with or battling in any given moment.

This also shows that the people in our churches will not be transformed simply by having more exegetical or theological information poured into them—no matter how correct that information may be. The information has to be embodied, has to become habituated into attitudes, patterns of response, and reflexive action.

The reason that spiritual disciplines are an important part of change is that they honor the physical nature of human life. Information alone doesn't override bad habits. God uses relationships, experiences, and practices to shape and re-shape the character of our lives that gets embedded at the most physical level.

A few decades ago scientists did a series of experiments where monkeys were taught how to pinch food pellets in deep trays. As the monkeys got faster at this practice, the parts of the brain controlling the index finger and thumb actually grew bigger. This and other experiments showed that the brain is not static as had often been thought, but is dynamic, able to change from one shape to another. This is true for human beings as well. The part of violinists' brains that controls their left hand (used for precise fingering movements) will be bigger than the part that controls their right hand.

But wait—there's more. In another study, people were put into one of three groups; one group did nothing; one exercised their pinky finger, a third group spent 15 minutes a day merely thinking about exercising their pinky finger. As expected the exercisers got stronger pinkies. But amazingly—so did the people who merely thought about exercising. Changes in the brain can actually increase physical strength.

No wonder Paul wrote: "Whatever is true, whatever is honorable, whatever is just, whatever is pure, whatever is pleasing, whatever is commendable, if there is anything worthy of praise, think about these things." Every thought we entertain is, in a real sense, doing a tiny bit of brain surgery on us.

Here's a thought worth contemplating: what must Jesus' brain have been like? Imagine having neural circuits honed and trained to trust God, to respond to challenge with peace, or to irritation with love, or to need with confident prayer.

Here's another thought worth contemplating: We have the mind of Christ.

That's worth wrapping your brain around.

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