Mind, Body, and Soul

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MIND, BODY, AND Soul

NEUROPSYCHOLOGY AND MENTAL HEALTH

THE FORCE-PLATE TEST

The old racquetball court has been transformed. Motion-sensor cameras line the perimeter of the ceiling, their circuits winding across the floor. An EMG is hooked up in a corner.

Lexi Eekhoff, a Dordt junior, sits cross-legged on the floor. In front of her is a large metal rectangle with a paper taped to the top. She is swiftly drawing lines, connecting numbers and letters.

At the other end of the room, senior Gala Campos watches a computer screen intently.

“Done.” Eekhoff stretches and sits back.

“Interesting,” says Campos. “The results
were different this time."

Under the supervision of Psychology Professor Dr. Bruce Vermeer, Eekhoff and Campos spent their summer on a new research project. Over the course of ten weeks, they worked on transforming the classic neuropsychology “trail-making” paper test.

Neuropsychological tests assess brain function through systematic, structured observation. Although these tests are useful, the current scope of data they provide is limited. For example, current tests only provide completion time, types of errors, and error rates.

Using computer technology, Eekhoff and Campos were trying to measure other factors. By placing the test paper on a force plate, they were able to gather new data. They could note force (how hard a person presses), velocity (speed), frequency/location of pauses, and average path length.

“We are encountering a technology crisis in neuropsychology,” says Vermeer. “Great techniques have been developed, but they don’t use more complex technology to the field’s advantage. This is an effort to do so.”

“It’s a new way of thinking about neuropsychological assessment,” says Eekhoff. “Right now it’s all paper-based. We are trying to do something that no one has done before. It was a lot of trial and error.”

“It was difficult to know where to start,” says Campos. “But once we started, things went really well—although analyzing the data was hard at times.”

With the help of engineering majors, Vermeer’s students created a program in Matlab, a software program for analyzing data, to produce graphics from the data received. They looked for commonalities and differences among the test subjects.

“When you get into it, neuroscience affects everyday life. Being able to detect disorders can really help people,” says Eekhoff.

So what comes next?

“Right now we’re looking at neurocognitive disorders,” says Dr. Tony Jelsma, a Dordt biology professor. “But the tests could also be applied to motor control. With Parkinson’s disease, for instance, initiating motion is hard to do. We’re measuring movement, but what is that movement indicating in the brain? Is it a motor control problem (my hand won’t move properly) or is it psychological (I can’t think of where to go next)?”

“This is groundbreaking,” Vermeer says with transparent enthusiasm.

NEUROPSYCHOLOGY AND MENTAL HEALTH

Before teaching at Dordt, Vermeer spent nearly 25 years in clinical practice. That experience has made him a valuable resource for students considering clinical work after graduation.

Some students are interested in neuroscientific research—focusing on events at a biological level—and some in neuropsychology—how brain function affects actions and behaviors. So Vermeer and Jelsma are weaving the two disciplines into one neuroscience concentration.

Neuropsychology is actually a fairly young discipline in its current form—less than 80 years old.

“It’s a burgeoning area,” says Vermeer. “Physicians have found that information gathered through neuropsychological testing provides them with information they can’t get in a CAT scan or MRI.”

Historically, psychology has focused primarily on thoughts and emotions. Now, it also studies the neurological functions that occur during those thoughts and emotions. And neuropsychological testing can examine how the brain and body interact—how activities in the brain influence behavior.

According to Tara Boer, a social work instructor at Dordt, neuropsychology has begun to influence mental health counseling. In traditional counseling, patients reported symptoms that counselors then attempted to diagnose. But with the introduction of neuropsychology, it is possible to understand more concretely what is happening in the brain.

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— Dr. Bruce Vermeer, psychology professor

Dordt student Lexi Eekhoff spent the summer working to transform the classic neuropsychology “trail-making” paper test.
from being able to see if their patients’ brains have been damaged—whether through addiction, trauma, concussion, or infection. Then the symptoms could be more easily understood and appropriately treated.”

The lower part of the brain, for instance, is responsible for the “fight or flight” response. When that kicks in, a person can only think about surviving and can’t think with the higher, logical part of their brain.

“This is why neuropsychology is so helpful,” Boer says. “When my fight or flight response kicks in, I can’t access my language, regulate my emotions, or make good choices in the moment. I’m completely dysregulated. When children have experienced trauma or abuse, that lower part of their brain is very developed. Providing this information to caregivers of traumatized children enables them to connect with their child, especially in difficult and chaotic moments.”

Mental illness is more common than most people realize, affecting at least 18 percent of Americans. The need for well-trained counselors has only increased in recent years.

But in some Christian circles, counselors are suspicious of the fields of psychology and psychiatry. They prefer to advise people using solely the Bible and often view mental illness primarily as a sin issue. Instead of receiving therapy or prescription medication, the patient is told to repent.

“The Bible gives insight, but it is not intended to be the total word on mental health. Studying the human mind and behavior is part of God’s general revelation,” says Psychology Professor Dr. Mark Christians.

Boer often points her students to John 9:2, where Christ’s disciples ask him, “Who sinned, this man or his parents, that he was born blind?” Christ responds that no one sinned; it happened that God might be given glory.

“For a long time we treated people with disabilities like they had sinned or their parents had sinned. That’s not real or right. There is sin in the world. It isn’t the way God intended it to be, and we’re experiencing its brokenness,” says Boer, who sees a direct correlation between physical health and mental health.

“Looking someone with depression in the face and saying, ‘You just have to repent and trust that God is good’ is like looking at a diabetic and saying, ‘Just pray, and God will heal your pancreas and it will produce insulin.’”

“If my arm is dangling by a tendon, I’m going to get help. If I’m at the end of my rope with PTSD, am I going to seek out psychiatric services? I hope so,” adds Christians.

When people understand brain chemistry, says Boer, they see that a depressed brain really looks different from a healthy brain. There’s something structurally wrong. And just as medication can heal a physical ailment, there are also medical ways to alleviate mental illness.

That does not negate the power of prayer. God brings about healing through faith and prayer. Just as a diabetic needs insulin, a depressed brain needs medication. Physical health and mental health are interrelated. But faith is a powerful tool in the healing process.”

“God could fix this mess right now, and social workers would be out of a job. But he allows us to be part of it. He is glorified both in the lives of people suffering and in our lives as social workers as we walk alongside them.”

— Tara Boer, social work instructor
all manner of means. But one of those means is human relationships and interactions.

"God could fix this mess right now, and social workers would be out of a job," says Boer. "But he allows us to be part of it. He is glorified both in the lives of people suffering and in our lives as social workers as we walk alongside them. We should consider it a privilege when someone comes to us for help, because God tells us to carry one another's burdens."

MIND, BODY, AND SOUL

"I belong, body and soul, in life and in death, not to myself but to my faithful Savior Jesus Christ..."

In contemporary neuroscience, a centuries-old dilemma has resurfaced: the "mind-body" debate. The debate, which originated with philosopher Rene Descartes, revolves around a fairly simple question: How does a physical body interact with a nonphysical mind or soul?

Recent neuroscientific research indicates that nearly every aspect of mental activity can be explained by brain functions. There doesn't seem—at least from a scientific standpoint—to be a nonphysical component to humans.

MONISM

In response to these findings, some Christians have adopted a view known as "monism"—as opposed to "dualism," which asserts that humans are made up of a physical and spiritual component. Monism proposes that humans are actually one whole substance, not a separate body and soul.

Christian monists argue that the idea of an eternal soul actually came from Greek philosophy, not from Scripture. The Hebrew creation account describes human beings as dust (matter), breathed to life. When we die, we return to that dust again (Genesis 3:19). And Daniel 12:2 says that those who sleep now in the dust of the earth will one day awake, "some to everlasting life, others to shame and everlasting contempt."

"In the Genesis narrative, there's no talk of humans having a body that a soul was 'stuck into,'" says Dr. Jeff Ploegstra, a biology professor at Dordt. "What's the point of our whole material being if it is basically irrelevant? Why was Christ physically resurrected if material things can be dispensed with?"

For Ploegstra, monism avoids the reductionism of valuing only the soul. Some strains of Christianity have focused excessively on the soul—often at the expense of valuing the body or the created world.

"Not only are you not just you," says Ploegstra, "you are also all the relationships that you have. If you take away someone's family, someone's friends, someone's hobbies—that changes who they are. I think there is an essence to a human—a soul in some sense—but it doesn't exist independently of the other aspects of our identity. Most importantly, our identity is found in Christ Jesus—our relationship with him defines us."

"Neuroscience is finding that we are irreducibly social," says Theology Professor Dr. Benjamin Lappenga. "There's something wonderful about that, something that gets at the heart of the Christian understanding of humanity. We are not just individuals. We are inescapably relational."

Throughout Luke and Acts, the conversion to faith is depicted as inherently social. "If we think in terms of a soul, then we tend to think of conversion in individualistic and intellectual ways. But a monist perspective takes seriously the way the New Testament describes conversion: embodied, social, behavioral transformation."

Monism also emphasizes the importance
of the resurrection of the dead. "It has us take seriously God's victory over death," says Lappenga. "Thinking about it in terms of an immortal soul brings Christians away from a truly biblical understanding of the seriousness of death. We really die. All the ugliness you see of a body decaying—that's the enemy that is death. When we recognize that reality, we can understand the true power of the gospel, and the audacious claim that it makes: these bones will live again."

DUALISM

Dualists argue that Scripture does suggest the existence of a soul, even if it is not explained in detail. They argue that certain passages indicate some intermediate state between death and the final resurrection. In Luke 23:43, Christ proclaims to the dying thief on the cross: "Today you will be with me in Paradise." II Cor. 5:8 describes being "absent with the body and present with the Lord." In Philippians 1:23, Paul says that he desires "to depart and be with Christ." And Revelation 6:9 describes the "souls" of martyrs under the altar.

For dualists, belief in the finality of death seems problematic. The idea that our departed ones are not with the Lord right now is a source of tension—emotionally and theologically. As Vermeer wrote in an article for In All Things, "Historically, we have drawn great comfort from the belief that our souls depart the body and transition into the presence of the Lord until the day that our renewed bodies will be reunited with our souls in God's new creation."

Dualists also note that there is not a consensus among neuroscientists: Some disagree that there is an obvious, one-to-one correlation between our physical brain and our mental activity.

For Theology Professor Dr. David Henreckson, this is where traditional metaphysics provides some interesting answers. Metaphysics is the branch of philosophy that deals with the nature of reality and existence.

"For the early Reformers, the body matters very much," says Henreckson. "But they also talk about the incorruptible soul, the form of the body. You can't quantify a human being. If you leave off the soul, it will give you insufficient explanation of what a human being is before God."

"Neuroscientific findings do matter," adds Theology Professor Dr. Justin Bailey, "because the soul and body are so tightly connected. But merely adopting scientific language can hem us in. We are material, but we have the breath of God. That requires some careful metaphysical handling."

So where does the answer lie? Among Dordt professors, there is more commonality than is initially apparent. Those on both sides of the debate have legitimate concerns and motivations. Both want to avoid reducing a human to a body or a soul. Both insist that physicality is good, yet not all that there is.

Bailey says, "In the end, I want the same thing monists want. We cannot dispense with the body; it means everything for how we experience the world. But we are not reducible to the body. The things we attribute to the soul may be accounted for by brain activity, but not reduced to brain activity."

"We're both reacting to a reductionist view of what it means to be human," says Ploegstra. "A human is not reducible to either your body or your essence."

"The truth is probably somewhere in that negotiated middle ground," says Mathematics Professor Dr. Tom Clark, "where we value the body deeply and the soul integrally. When it comes to a view of the soul, there's some real mystery."

For both monists and dualists at Dordt, the body and soul are inextricably intertwined. And so the work being done by neuropsychology students like Campos and Eekhoff, or counselors like Christians and Boer, is crucial. If the mind and body are cared for, people will flourish.

Whatever we are, we know that we are fearfully and wonderfully made. We know that one day, we will be raised incorruptible. And we know that in this flesh, we shall see God.

For now we see in a mirror dimly, but then face to face. Now I know in part, but then I shall know fully, as I have been fully known. (1 Corinthians 13:12 ESV)