SETTING THE STAGE

If the gene was the central issue concerning 20th century biology, the brain (and by extension the mind) will be the central issue of the 21st century — or at least this is the way Nobel Laureate and neuroscientist Dr. Eric Kandel sees things. Kandel has been studying the brain since the 1960s and he believes that scientists are making tremendous strides in terms of understanding the workings of the brain. His pioneering work has inspired neuroscientists like Richard Beninger of Queen’s University who puts brain science in perspective when he says, “It’s certainly extraordinary, our entire experience of life, all our mental experiences, if they all result from the activity of chemistry in our brain, the activity of neurotransmitters and neurocircuits, it’s amazing.” (CBC.ca, January 2, 2013)

Essentially, if you trace a path from the work of Kandel to the work of Beninger, you will see a seismic shift in what we thought we understood about the brain 40 years ago and what we know about the brain today.

We know quite a bit

And what we know is quite a bit — though the work is very, very far from finished. Today, scientists have mapped the brain and have a solid understanding of the areas of the brain that are stimulated when people think certain thoughts and feel certain feelings. They also understand the chemicals that rush through a person’s system when they think or feel.

Dopamine

The chemical that is of particular interest to today’s neuroscientists is dopamine. This chemical is prolific in the realm of motivation and behaviour. When a person is seeking something — whether it is a friend, food or information — dopamine courses through that person’s system and provides encouragement for the seeking. If what is being sought is repulsive other brain systems will step in to stop the person from the pursuit. In a perfect world, dopamine allows you to seek what you desire and the other brain systems work to keep you from harm. In fact, it is our relationship with the dopamine in our system that can shape everything from our relationships to our addictions.

Addictions

That’s right: addictions. A considerable amount of research has gone into the link between dopamine and addiction. Whether it’s drugs, alcohol, food, sex, shopping or gambling, people with addiction issues unconsciously crave the dopamine surge as much as they consciously crave to satisfy the hunger of their addiction. Therefore, even though a heroin addict knows that the drug is destroying their life, dopamine has taught them to seek the drug and they are following through on that lesson.

Scientists have discovered that stifling dopamine doesn’t help an addict because they simply stop seeking the things that they need — like food.
and shelter. So another solution needs to be found — one that allows dopamine to continue to do its work but also stimulates other parts of the brain to put a lid on addictive behaviour.

**Only the beginning**

While the dopamine issue is just one of many areas of interest for neuroscientists, the ramifications of research in this area could be profound in terms of providing insight into the human condition. Understanding behaviour has been at the core of psychological and psychiatric pursuits since these sciences joined religion and philosophy in trying to bring clarity to the human search for meaning. Now brain research may provide valuable insight into why we do the things we do — potentially providing addictive personalities with help in terms of correcting self-destructive behaviour. If inroads can be made in the relationship between dopamine and addiction, there is no telling what other strides neuroscientists will be able to make with a multitude of other mental illnesses that could potentially plague well-meaning people in the coming years.

**To Consider**

1. Why does Dr. Eric Kandel believe the brain will be the central issue for 21st century biologists?
2. What is dopamine?
3. What role does dopamine play in addictive behaviour?
4. What potential benefits would we see if we gain a deeper understanding of the role dopamine plays in our lives?
VIDEO REVIEW

Pre-viewing Questions

1. Do you have control over your thoughts or are they random?

2. Describe what happens to your body when you feel happy, angry, and sad?

3. How much do you know about the inner workings of your brain?

Viewing Questions

1. What impulse — an impulse that proved helpful thousands of years ago — might be becoming detrimental to human survival?

2. How long ago did we start:
   Farming _______________
   Building cities _______________
   Using electricity _______________

3. Why are many of today’s children not afraid of a busy road?

4. What role do dopamine neurons play in human decision making?
5. What substances do scientists believe have the ability to hijack the brain’s reward system?

6. What happens to the brain of someone who is addicted to food?

7. Why can dopamine disruption be catastrophic? How is this illustrated in the documentary?

8. What is catalepsy?

9. What role does dopamine play in our social interactions?

10. What damage can childhood trauma do to the brain?

11. What information does a brain scanner provide for neurosurgeons?

12. What work does the brain do when people are seemingly at rest?
13. What role do abnormalities in the brain’s resting state play in the emergence of mental illness in some people?

14. What is the official name of the brain’s resting state?

15. What are scientists trying to accomplish with Theresa Kinney? How do they think they can help her deal with her childhood trauma?

Post-viewing Questions

Dr. Blair Woodside of the Toronto General Hospital took a radical step in the treatment of several women with anorexia nervosa. He implanted a pacemaker-like device into their brains to target an area believed to be part of the anorexia problem. Woodside and his team of specialists found that three of the six patients they operated on were able to maintain a body mass index that took them out of the danger zone that anorexia had put them in.

1. Is this a viable option for surgeons to consider when it comes to anorexic patients?

2. What about the underlying psychological issues that anorexics suffer from like a distorted body image and low self-esteem? What effect would the surgery have on these issues?

3. In your opinion, will scientists eventually be able to solve all mental problems through surgical or brain stimulation procedures? (Really think about this one before you answer it)
ACTIVITY: Avoiding Buyer’s Remorse

Minds On

Have you ever had the experience of purchasing an item and then feeling guilty about spending all that money on something you really didn’t want or need? This is called buyer’s remorse and it is the unfortunate side effect of your brain flooding your system with a chemical called dopamine. This chemical fools you into thinking the item or object will give you great pleasure.

Beating Buyer’s Remorse

According to neuroeconomist Brian Knutson, the only way to beat buyer’s remorse is to defeat the reward system by activating the pain system of your brain. Here’s how it’s done:

1. Be the boss of your brain
Be aware of two functions of the brain: the reward system and the pleasure system. Both systems create a chemical reaction that cause you to either blindly want a reward or to experience discomfort or pain. When shopping, the reward system promotes thoughts of enjoyment and pleasure while the pain system reminds you of cost and potential pitfalls to buying an item. In many cases, people will only employ the reward system when shopping because they prefer to feel pleasure and suppress feelings of pain.

2. Pay in cash
In order to activate the pain system, pay in cash. Often seeing the cash fly out of your wallet will be enough to remind you of the real cost of an item. Paying with cash has proven to be effective in controlling consumer spending.

3. Trick your mind
Pretend that your sworn enemy already owns the item you desire. While this mind trick seems a little juvenile, it is an effective way of keeping the money in your pocket. Essentially you are activating the pain system of your brain to make an item you desire seem repulsive

4. Delay your purchase
Delay every purchase you make. Knutson noted that putting a 10-minute delay in effect often sees a person re-evaluate a purchase. Suddenly the benefit or value of the item loses its lustre as a little bit of time passes.

5. Smell a fish
Pretend you smell something rotten. Think of a smell that makes you sick and then tell your brain to smell it. Specifically, Knutson’s research indicates that people are less likely to buy when they smell a fish (unless they are buying a fish). He also notes that retailers use “scent marketing” when you enter a store. So if you ever wonder why some stores smell so nice when you walk in, now you know. Just remember to smell a fish when you don’t want to buy something.


Followup

Try the strategies! Go to the mall and start shopping. When you see something you want, use one or more of the strategies suggested. See if they keep you from buying things. Note the thoughts that run through your mind as you are shopping. How are these thoughts different from the thoughts that normally occur when you are shopping?
**ACTIVITY: Technology and the Dopamine Loop**

**Minds On**

1. Do you think you are addicted to your computer or smartphone?
2. How long could you go without using your computer or smartphone?
3. Do you depend on your computer or smartphone for information? Explain this dependency.

**The Dopamine Loop**

Have you ever wondered why you can’t stop checking your computer and smartphone. Well you are quite simply caught up in “the dopamine loop.”

Dopamine is a brain chemical that influences everything from your mood to your sleep patterns. One of dopamine’s primary roles is to seek information and experience rewards. While many people think dopamine is really just about activating the pleasure system of the brain, neuroscientists believe that the brain chemical is really configured to seek and, if pleasure comes from that seeking, so be it. However, dopamine-triggered thinking and behaviour can often have negative consequences like when addicts seek their drug of choice despite the fact that the drug is ruining their lives. This is why the emphasis when analyzing dopamine should be on seeking behaviour.

**Unable to resist**

So what does this have to do with your computer and smartphone? Whether you are surfing the internet on your computer or texting on your smartphone, these devices provide seekers with almost immediate gratification. When a person hears the ring, ding, or ping of their phone, they know that someone is seeking them. In turn, they want to find out right away who wants them and will enter into a text or e-mail exchange based on the initial contact. Fewer and fewer people can resist the sounds of their smartphone because they are caught in the seeking system of the brain known as the dopamine loop.

Similarly people surfing the internet often find themselves losing track of time as they move from link to link. YouTube is a classic example of people getting trapped in the dopamine loop. They will seek one video, watch it, and once it ends they will be given a cluster of new options that may or not be related to the original video that the person was looking for. As a result, they may click through five or six (or 15) videos before checking the time and seeing that an hour of their life has just passed. Once again, the dopamine loop has been activated and the seeking system peruses in earnest.

**Social media**

Social media like Twitter have particular power to pull people into the dopamine loop. The fact that Twitter messages are limited to small chunks of information makes seekers particularly attentive to what is being offered. As a result, people can spend considerable periods of time moving from one tweet to the next. Facebook is another example of condensed information that simply encourages the dopamine loop to keep people seeking and reading.
Neuroscientists note that the various sounds computers make and the ringtones of a smartphone are particularly important when it comes to the activation of the dopamine loop. Auditory and visual cues trigger the attention of people and draw them into the dopamine loop. These cues are very difficult to resist which is why you occasionally hear about people walking across a busy street while checking their Facebook updates or texting while driving a car. They just can’t seem to resist the call of the dopamine loop even though logic dictates that they need to use their brain to keep themselves safe.


Activity

1. Monitor your computer and smartphone use for a day. Note how many times you check your computer or smartphone without being prompted. Also note how many times you check your computer or smartphone based on an auditory or visual cue.

2. Keep track of the time you spend on your computer and smartphone. Does the amount of time you spend on these devices surprise you or not?

3. Try to defeat the dopamine loop. Spend one day away from your computer and ignore the ring, ping, or ding of your smartphone. Write a one-paragraph reflection of how you felt over the course of your one-day sabbatical away from the dopamine loop.
FOCUS FOR READING: The Marketer’s Guinea Pig

Minds On

How would you feel if you learned that marketers are using brain science to try to manipulate you into buying products? Would this surprise you? What restrictions do you think should be placed on retailers who use brain-based marketing to get people to buy their products?

Neuromarketing

In 2008, Diana Lucaci left her job as marketing director at Bell and started a neuromarketing firm called True Impact. Lucaci, who holds a degree in neuroscience, wanted to combine her marketing experience with her knowledge of the workings of the human brain. So she started True Impact and now holds sway over companies like Rogers, Pizza Pizza, Royal LePage and Axe in their quest to get consumers to purchase their products.

Biometrics provides a statistical explanation of biological events. In the case of neuromarketing, biometric data objectively explains brain reaction to marketing strategies.

It’s in the biometrics
Essentially what Lucaci and her colleagues do is collect biometrics that tell a company whether or not you might like their product. They do this by using devices like an electroencephalogram (EEG) or a functional magnetic resonance imagining (fMRI) to monitor your brain activity when you are viewing images, commercials or while you are shopping. These devices simply tell the neuromarketer when the areas of your brain associated with pleasure are stimulated. The process is very precise as the brain scientists pinpoint — to the second — when a person responds to something they have seen or heard. Meanwhile, the person in question might not even know that they found the image or sound pleasurable. The data collected is called biometrics and companies use this information to determine whether or not to proceed with a specific marketing plan or sales approach.

Why choose neuromarketing?
For the most part, companies rely on focus groups to gather data relating to their marketing plans. This process is very expensive and very subjective — in other words, many marketers wonder if people are saying what they truly believe or simply saying what they think the marketers want to hear. On the other hand, neuromarketing bypasses the verbalized thoughts of people and goes straight to the brain for the information. They don’t need to know what a person thinks — they need to know when a person thinks a thought that makes them feel good. Neuromarketers believe this is objective data that can be used by companies to pursue their plans. However, they are quick to point out that they simply gather the data and that there is no magic marketing pill when it comes to consumer behaviour. Consumers still might reject a product based on innumerable other factors that brain science simply cannot predict.

Neuromarketing works
However, if you talk to neuromarketers, they’ll tell you that this new field of study has yielded some promising results. In 2009, Frito-Lay hired neuromarketers to try to figure out why women tend to shy away from their chips. It didn’t take long for brain scientists to discover that women
were having an adverse reaction to the packaging of the chips. Apparently the yellow chip bag was triggering a part of the brain associated with guilt. Frito-Lay redesigned their chip bag, introduced a new marketing plan, and their market share went up eight per cent.

Another example came from the carmaker Volkswagen. In 2011, the car company rolled out a commercial that featured a young boy dressed as Darth Vader turning on his father’s car with the power of his mind (or the “force” if you are a Star Wars fan). Meanwhile his father was turning the car on with his automatic car starter inside the house. Traditional focus groups weren’t really keen on the commercial but brain scientists found significant biometric spikes when tested on human subjects. Volkswagen ran with the commercials on Super Bowl Sunday and their U.S. sales went up 26 per cent.

**Is your mind for sale?**

The next step for neuromarketers is to come up with a code of ethics regarding the use of biometrics. The guiding consideration: is it ethical to steer a person’s brain toward constant consumption? In other words, where is the line between marketing and brainwashing? Marketers and advertisers are trying to come to terms with this issue. In the interim, shoppers will be left to wonder if, the next time they make a purchase, biometric data played a role in their choice to reach into their wallet and buy a product.

**Questions**

1. What is neuromarketing?
2. What does a neuromarketer look for when they are conducting a study?
3. Why would companies choose to go with a neuromarketer instead of a traditional focus group?
4. What evidence is there that neuromarketing works?
5. Do you believe that neuromarketing is a legitimate sales approach or is it a form of brainwashing?