

# BRAIN SCIENCE PODCAST

*With Ginger Campbell, MD*

## Episode #13

A Discussion about Unconscious Decisions, Based on the Book *Blink* and Other Sources

Placed on-line: June 1, 2007

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## INTRODUCTION

This is the *Brain Science Podcast*—the podcast for everyone who has a brain—and I'm your host Dr. Ginger Campbell. On the *Brain Science Podcast* I explore how recent discoveries in neuroscience are unraveling the mysteries of how our brains make us who we are.

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This is the *Brain Science Podcast* [Episode 13](#). Today's topic is how we make rapid decisions without conscious thinking. But before I get into the topic of the day I do have just a few announcements.

I have a [new episode of Books and Ideas](#) that I just posted. It's an interview of Neel Varshney who is about to graduate from Harvard Medical School. He is going into neurology, and we talked for a little while about his research experience in neuroscience. Some of this relates to topics we've been discussing recently on the *Brain Science Podcast*, so even though I didn't put this podcast in the *Brain Science Podcast* feed, I hope you'll go check it out at [booksandideas.com](http://booksandideas.com).

I've mentioned in the past that I have been getting emails from people all over the world. I really enjoy this and I would like to have a way for all of us to be more connected and learn about where we all live. So, I started a Flickr Group. Flickr is a website where people upload their photos, and it's free. The address is [flickr.com](http://flickr.com). If you want to go to the Brain Science Podcast Community Group it's at [flickr.com/groups/brainscience](http://flickr.com/groups/brainscience). There will, of course, be a link to this website in the Show Notes.

I think there are a few members already, because I sent out an email to those of you who I'd already heard from; so there are already pictures up there from Portugal, England, and the United States. I'm looking forward to getting pictures from all over the world. When you post your pictures please remember to say where they're from, even if they're in the United States. It is also possible at the Flickr Group to post discussions, so anyone who wants to can use this as a temporary source for a discussion forum until I get the forums up next month.

As always, you can find more information about this podcast at [brainsciencepodcast.com](http://brainsciencepodcast.com) and you can send me email at [docartemis@gmail.com](mailto:docartemis@gmail.com). This is also a good place to go if you haven't already subscribed to the podcast.

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## **DISCUSSION**

Let's get into today's topic. The inspiration for today's episode is the book, *Blink: The Power of Thinking Without Thinking*, by Malcolm Gladwell, the best selling author of *The Tipping Point*. I'm not going to discuss this book in detail because it's a pretty easy read and it's a best seller, so you may have already read it. I'm just using it as a jumping off point.

*Blink* introduces the idea of the role of unconscious decision making, and my theme is going to be really starting to look at the importance of the unconscious.

We have already seen this when we've talked about memory and emotions, so this isn't an entirely new idea to those of you who have already been listening to the podcast. This podcast is probably going to be a little lighter than recent podcasts, but rest assured that we are going to go into these ideas in more detail in the future.

One of the things that makes Gladwell's book effective is that he uses a lot of real life examples to illustrate his main idea, which he says is, "...to convince you of one simple fact: Decisions made very quickly can be every bit as good as decisions made cautiously and deliberately." His main example involves a museum which bought a bogus statue after subjecting it to all kinds of fancy scientific tests. But then, when a couple of experts on Greek statues saw the statue, they knew instantly that it was a forgery.

If you listened to the last episode of the *Brain Science Podcast*, which was about memory, you may recall that we learned that the memories of experts involve pattern recognition, and that these memories may be implicit. This is really what happened when the experts saw the fake statue. They knew instantly by pattern recognition that something didn't fit.

But this unconscious rapid decision making isn't just something experts do. It is an unrecognized part of our day-to-day lives. This was demonstrated in an experiment which is described in detail in the book in which subjects were told to bet on cards. They came from two decks—one was red and one was blue—and one deck was bad; that is, if you bet on it you would lose money.

What they found was that the people would begin to show physiological signs that they knew one deck was bad before they had even a hunch about what was going on. They would also start changing their betting behavior before they were even consciously aware of it. Then a little while later they would begin to have a

hunch, and eventually they would be able to say exactly that the one set of cards was the bad set.

But the point is that they actually had an unconscious awareness of the pattern before it reached their consciousness, and it affected their behavior. One of the key ideas here is the fact that the mind is more efficient when higher level thinking can be moved down into the unconscious. A real easy example of this is when you learn how to drive a car.

You may recall how difficult it was—how much conscious attention it took—when you were learning how to drive. And now, most of us when we drive are fairly unconscious of the mechanics of driving, even if we are hopefully paying very close attention to the road conditions and other things related to driving. This also is probably the reason why talking on a cell phone while driving is a very tempting activity that people don't want to admit impairs their driving abilities.

The point is that we are always taking in information, some of which we are not consciously aware of, even though it is affecting our behavior. One example that comes to mind for me is the fact that most of us can easily recognize when somebody's smile is fake, even though most people couldn't tell you how they know. Most people don't know about the muscles around the eye that only contract when a person is having a real smile. Yet most people can recognize the difference between a real smile and fake smile; so obviously this recognition is occurring at an unconscious level.

Our so-called unconscious is a very powerful force. And sometimes it goes by other names. And the more we learn about the brain, the more these other names seem like misnomers. You hear it called things like instinct, gut reaction, or intuition. And you also know of people who think of these abilities as being somehow mystical or psychic. But basically they're just part of our normal brain function.

But despite its power we need to recognize that our unconscious decision making is fallible. And this leads us to questions such as when do we trust it. But even so, Gladwell argues, “There can be as much value in the blink of an eye as in months of rational analysis.” I’m sure that each of you has had an experience in your life where you had an instinctual or gut reaction about what to do, and then overanalyzed it and ended up making a decision that you regretted. And when you looked back you knew that your first reaction of what to do was really the right one.

The meat of Gladwell’s book is to discuss what he calls the theory of thin slicing, which he defines as the ability of our unconscious to find patterns in situations and behaviors based on very narrow slices of experience. He says this is what makes our unconscious so “dazzling.” However, I think that Jeff Hawkins in his book, *On Intelligence*, argued that this is really just because the brain is structured to do pattern recognition at every level, and this pattern recognition gets moved down into the unconscious as much as possible.

One of the examples in the book—and I’m not going to use most of them because I don’t want to ruin the book for you—but one of the examples that I really liked was when he talked about Vic Braden. Vic Braden is a famous tennis teacher. He was probably a pro back when he was young, but I think he is about 80 or more now, and he is famous for his skill at teaching. He has the ability to tell when somebody is going to double fault before they do it, but it kind of drives him crazy, because he really can’t figure out how he knows it.

This illustrates the point that most of us are very resistant to acknowledging that some of what we know is not accessible. One of the implications of this inaccessibility is the fact that we are more susceptible to outside influences than we realize. Priming is an example of this phenomenon. Priming is done in experiments when before the actual experiment the subject is exposed to a particular thing to see whether it’s going to affect the results. For example, in

memory experiments they expose the subjects to certain letters before they show them the words and notice how it affects their ability to recognize the words rapidly.

In the experiment mentioned in this book he gives an example of students that were exposed to two different sets of words—one set of words was very polite kinds of words, and the others were words like ‘bold’, ‘aggressive,’ ‘rude,’ etc. After they were exposed to these words they were sent to have a conversation with somebody, but when they got there they were forced to wait. What they noticed was that the people who got the negative words were much more likely to interrupt the conversation, and those that were primed with the polite words almost never interrupted.

So, this kind of priming can affect our behavior, and it has also been shown to be very influential on whether or not people show prejudicial behavior in certain situations. I have mentioned Antonio Damasio many times in the past. His work has shown that there seems to be a small area in the prefrontal cortex—called the ventral medial prefrontal cortex—that is involved in rapid decision making. People that have damage to this area remain smart and rational, but they lack judgment. For example, they can’t decide when they want their next appointment to be.

And remember the gambling example that I gave earlier? If you subject them to this experiment they never get a hunch about which set of cards is bad. And, this is the weird part: Even when they realize the pattern consciously they don’t change their strategy. You would think that if you could rationally figure out the right thing to do you would be able to get by without this rapid decision making. But it turns out that you can’t.

One factor in this that Gladwell talks about is—he calls it the story telling problem—but what he’s really referring to is the human tendency to invent explanations.

This isn't done consciously; this is just the way our brain works. The researchers that worked with split brain patients—and I've read about this in several different sources—have accumulated lots of evidence for this.

In the split brain patient the left side of the brain doesn't know what the right side is doing. So, let's say that the right side of the brain is given a command to do something. The way this would be done is it would be a message that only the left eye can see, since the visual messages are crossed. So, the right side of the brain is given a message like, 'Pick something up.' The left side doesn't get the message because the two sides aren't connected.

Well, the person will make up a reason for why they picked something up. Since they didn't see the message, they can't say, 'I did it because I saw a message.' So, they'll make up something. And this is just a simple example of this phenomenon. People consistently will see patterns where none exist.

Why does this happen? It happens because we are wired for pattern recognition. It helps us to make rapid decisions; but it can lead us astray. However, I would say that I would take the trade-off. Remember the example that we talked about several podcasts ago about how when you see something that looks like a snake, your first reaction is fear—because the rapid pathway goes to that—and then you figure out it's just a stick and then you calm down?

Well, personally I'll take the rapid pathway. I want to get out of the way of the bus before I figure out what it is. I want my hand to pull away from something hot before I'm consciously aware that it's hot, so that I won't get burned as badly. Still, our tendency to create patterns when they don't exist means that we are going to have a tendency to create explanations rather than to acknowledge that we don't know why we did something or why we feel a certain way.

I've seen this in medicine. You may have heard of clinical judgment. A lot of clinical judgment is really occurring with that pattern recognition that's at the unconscious level: you see a patient and you just know something is wrong. One of the first things that you have to learn as a physician is to trust that knowing, even if you can't explain it.

The natural reaction for most people to that feeling is to order more tests. But the most important thing is to learn not to ignore that feeling. Even so, if you talk to a doctor later who had, say, a hunch that something was wrong with a patient, they're rarely going to admit that the feeling was at that level. They're going to give you some story, even if it's something as vague as, 'He just didn't look right.' They don't want to acknowledge that it was unconscious. And this is just, I think, human nature.

The other side of the coin is that we can get led astray by unconscious cues that we aren't aware of. There are two examples given in the book. One is the election of Warren Harding as president. Apparently he was a really bad president. I don't know much about that period of history, so I don't know any details. But apparently he was like the tall, dark, handsome guy who looked presidential. And that's how he got elected, even though he really wasn't very smart and turned out to be a pretty bad president. But people responded to him on the gut reaction that he looked presidential.

The other example that Gladwell gives is New Coke. A lot of you probably will remember the disaster of New Coke. Apparently the reason that got on the market was because they had people doing blind sip tests and they said they liked the New Coke better. But the problem was they were testing it completely out of context, and people don't really choose their drinks that way. And when they put this product on the market people actually hated it, and they had to bring back the old Coke—although those of us who remember real Coke know that Coke Classic is not the real thing.

So, when we try to explain things that are really unconscious processes our explanations are likely to be wrong. Ted Williams claimed he could see the seams on a baseball, yet the evidence is pretty overwhelming that human eyesight cannot perform at that level. For example, I've read one of Vic Braden's books and he talks about the fact that it's been shown that the human eye can't actually see a tennis ball bounce; which means that when people make line calls they are prone to error because the brain is really extrapolating the path of the ball. I mean you're convinced you see it bounce. Anyone that plays tennis would tell you that they saw the ball bounce, but the physiological reality is you can't see it. It's kind of weird, but true.

This brings me to a subject that I was going to mention that's really not in *Blink*, and that is the fact that there are a lot of motor activities that we have to do faster than we can do using conscious awareness. This is discussed in Susan Blackmore's book, *Consciousness Explained*, when she talks about how doing something like returning a high-speed pro level tennis serve has to happen faster than you can have conscious control of. So, this whole idea of unconscious decision making really goes deeper than the kind of examples that Gladwell gives in this book.

So, if we're making these thin slice rapid decisions, what's going to happen when we have to make a decision under stress? Because then we are going to have more tendency to error. So, how do we make better rapid decisions? Some of this is kind of obvious. One is having training, and rules, and rehearsal or practicing. That's the reason why all kinds of emergency personnel—firemen, policemen, military, and medical—practice the scenarios that they may face, such as cardiac arrests.

It also helps to have an algorithm—which is kind of a set of either/or choices—so that you'll focus on what really matters and not be overwhelmed. There's a pretty detailed example of this in the book which relates to taking care of people with

chest pain in the emergency room. But the main point is that decision making can actually be impaired by too much information, so the point of an algorithm is that it helps you to focus on the information that matters.

For example, during a cardiac arrest we follow what we call the ABCs—which stands for Airway, Breathing, Circulation. If the person doesn't have an airway, nothing else you do is going to help them. If they're not breathing, nothing else you do is going to help them. If they don't have circulation, you have to do a certain thing. Those are the priorities that we follow, and they help us keep focused during the pressure of the cardiac arrest.

Training and algorithms help but, still, we need to find a balance between deliberate and instinctive decision making. And this is where I think experience comes in. I don't think there's any substitute for experience, whether you're an emergency physician or a car salesman. I don't think you can find any doctor who doesn't remember how overwhelmed they felt on their first day as an intern.

Part of this balance comes from being able to ignore too much information—that's where the algorithms come in—because it's been shown that having too many choices causes paralysis. I think we've all had the experience where we were going to go shopping for something and we got to the store and there were so many items to choose from that we were overwhelmed, and went home with nothing.

They did an experiment with this once with family physicians by giving them therapeutic options for patients with a certain disease. And they found that if they gave them more than two or three options the physicians would just choose not to do anything—in other words, just stay with their current treatment. Too many choices causes decision paralysis.

Another aspect of this whole rapid decision making area is the effect of familiarity. And this brings us back to when we talked about the mere exposure effect—that if someone was exposed to a certain thing and then later asked to choose among various objects which ones they liked, they would tend to pick the one they had already been exposed to. This is one of the bases of advertising. People have a tendency to prefer the familiar and to dislike anything that's new or different. Probably we get some kind of dopamine surge when we have a pattern recognition that fits—although I don't know if this has been actually documented.

This means that market research may not be able to tell whether people dislike something because it's bad or because it's just different. And he gives in the book two examples of TV shows from back in the 70's: *All In The Family* and *Mary Tyler Moore*. Both of these were hit shows, but they did very poorly in the marketing before they went on the air. And they only made it on the air because they had already been scheduled; and back in those days they didn't cancel shows as quickly as they do now.

I want to come back for a minute to the subject of the role of expertise. Many of the examples in the book are people who show outstanding thin slicing because of expertise. What does this mean? For one thing, an expert has the ability to have more accurate pattern recognition and they can more reliably account for their reactions. Partly this is because they have a vocabulary to describe their experience. For example, when a doctor goes in the room he has a vocabulary to describe what he's seeing that is more useful than a layman's description would be.

So, experience and passion—being interested in something—fundamentally change the nature of our first impressions. This just means that a non-expert's first reaction will be more shallow, harder to explain, and easier to disrupt. So, getting back to the question of when should you trust your snap judgments, you

might ask yourself whether you're making a snap judgment about something that you are an expert at or not.

When we talked about emotions a couple of episodes back we talked briefly about the anthropologist, [Paul Ekman](#), who was the one who showed that certain facial expressions are universally recognized. He was working with a guy named Wallace Friesen, and they isolated 43 distinct muscle movements in the face. Then they spent seven years cataloging all the possible facial expressions—which was about 10,000—and they found that about 3000 of them were meaningful. Then they assembled them with rules for interpreting them into something called the Facial Action Coding System.

Why did they do this? They did it because the face is such a rich source of information, and this can be used to help train people that have to make decisions in difficult situations to be able to have more accurate rapid interpretations. One of the odd things—and I think I mentioned this before—is that reproducing a certain facial expression for a certain emotion can cause the same physiological effects as the emotions. We usually think of emotions as being reflected on the face, but they can actually start in the face. And we've already talked about the fact that not all expressions can be consciously controlled because the basic emotions are automatically expressed by the muscles of the face.

How does this relate to today's topic? Well, we normally get so much information from other people's faces that we can almost literally read their minds. But because we do this unconsciously we pretty much take it for granted. We'll say, 'He's mad,' or, 'She looks sad,' or something like that, and we don't even think about how we're acquiring that from a combination of their face, body language, etc. But people with certain types of brain damage lose this ability

And it has been shown that people with autism also lack this ability. Experiments with functional MRI show that normally we use something called the fusiform gyrus when we're looking at faces, compared to objects. When we're looking at an object we use the inferior temporal gyrus. But autistic people use the object recognition area—the inferior temporal gyrus—for both faces and chairs, so they don't get the same information because they're not using the right part of the brain.

Now, there are situations of pressure where thin slicing, or rapid decision making, is bound to break down. If a person is so aroused that their heart rate goes up, this has an effect. If it goes up over 145, people tend to lose the ability to perform complex motor skills. And it has been shown that if it goes over 175, their cognitive processes break down and the midbrain—which is a more primitive part of the brain—takes over. Which is why people in these situations may do things that later look rather illogical.

This is very important in police work because not only do they get highly aroused, but they can be in situations where they have a lack of lead time. This is shown in events like people shooting unarmed suspects. Usually when this happens the person is sure they actually saw a gun. Clearly they made a misinterpretation of their visual information in that small amount of time. The police do a lot of work in trying to minimize the likelihood of these events. And training and experience improve rapid decision making, so most of the examples of accidental shootings of suspects happen with younger, less experienced officers.

There's one other example that I want to talk about from the book just briefly because this whole fact about how our snap judgments can be corrupted might seem a little bit controversial. None of us wants to think that we're going to make a snap judgment based on prejudice or anything. But here's an example that shows how easily this happens.

The way that orchestra musicians are chosen has changed in recent years. It used to be the conductor was an autocrat and he chose the musicians himself, and they did their audition in front of him. This was later changed to having a committee, and to having blind auditions where the person trying out was behind a screen so that the judges could not tell whether they were female or male, tall, short, fat, graceful-looking or dorky-looking, or whatever. And it was found that this had a big impact on how orchestras were chosen.

The most obvious change was that more women musicians were chosen; especially for those who played instruments like the French horn, which for some reason is considered a manly instrument. Before this process went into effect very few women made it into the orchestras. Obviously, even if it was unconscious, the judges were thinking that the women were going to be less good than the men and it was affecting their judgment.

Before I conclude there is one other thing that I wanted to talk about that's not really in the book, *Blink*, but relates to this whole issue of unconscious decision making. These are three examples that I read in *Consciousness: An Introduction*, Susan Blackmore's 2004 textbook. I already mentioned the fact that responding to something like a high speed serve happens faster than you can consciously control.

There was another experiment related to this that she mentioned where subjects are shown a moving light and told to point at it. And sometimes in the experiment they'll move the light during the saccade—which is the time when our eyes are actually moving and we literally can't see during that time; at least consciously. They move it during that period and the person still points accurately, even though if you ask them they'll say that the object didn't move. This is another example of a sensorimotor event that's unconscious.

But I wanted to mention some experiments that were done by Benjamin Libet. He did two experiments that are both important and controversial. Actually, he did lots of experiments, but these are just the two that I'm going to mention. One is that he showed that it requires about a half a second of neuronal stimulation before it can reach conscious awareness. This means that we'll have no conscious awareness of anything that lasts less than half a second; but it doesn't necessarily imply that other parts of our brain don't get the message.

In fact, Daniel Dennett in his book, *Consciousness Explained*, goes into a great deal of detail about how our perceptions are revised—that is, what we say we saw is not necessarily what we saw. I don't have time to get into the details of that today. It's a very fascinating subject and he's got some great examples in the book, if you are interested.

The more controversial experiment that Libet did was one in which patients were told that they were going to move their arm; but they got to choose when they were going to move their arm. What he wanted them to do was to indicate when the thought came for them to move their arm; although, obviously they had then moved their arm. At the same time he was recording something called the readiness potential, which is a shift in electrical potential that occurs before voluntary muscle movements. And what he found was that the readiness potential happens about 350 milliseconds before the person indicates any intention, and about 535 milliseconds before the actual action.

Does this mean that consciousness doesn't control our actions? These results have been debated from many angles, including methodological questions about whether or not this is accurate. But it has actually been reproduced. Some philosophers think that these kinds of results—and many others—prove that free will doesn't exist. Daniel Dennett, who I mentioned before, has a viewpoint that is considered radical. He says, "Free will is indeed real but it's just not what you

think.” That’s a quote from page 223 of his book, *Freedom Evolves*, which was published in 2003.

When we think about this rapid decision making and the role of unconsciousness, the first thing that I wanted to accomplish with this episode was just to make you aware of the role of rapid unconscious decisions and for you to try to start recognizing times in your life when it happens. Every time you think you know how someone else feels you are using this ability.

Personally I think it would be valuable for us to learn more about this so that we can make better rapid decisions. And I think it’s important that we learn what kinds of things cause errors in our rapid decision making so that we can be aware of where these errors might occur. These might be times when we might want to stop and reflect before we act, if possible.

Another point that I wanted to make is that this work shows that instinct—or intuition, or whatever you want to call it—is not something mysterious or mystical. It corresponds to parts of our brain interacting with our body, so it is something that can be studied scientifically. But, of course, one of the questions that we will be returning to is the whole area of unconscious decision making.

Perhaps the idea of calling it decision making might even be called into question by those who wonder whether or not we really have free will. There are people who think that if we can show that the brain is the cause of what we do, somehow that deprives us of free will. I’m not ready to go that far; especially when we consider things like the fact that it has been shown that meditation can lead to changes in the brain.

But I hope that you will start to pay attention to the role of rapid decision making in yourself and others. And try to catch yourself when you do something without knowing why, before you make up a reason. Experiment with saying, ‘I don’t

know why I did that.’ I promise it won’t kill you. But, as you can see, this is an area that we need to get into in more detail in future episodes.

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I think the next episode of the *Brain Science Podcast* is going to be based on a book I’m reading called, *Why Choose This Book?* It is about the computational model of the mind. But sometime in the near future I hope to do something on the prefrontal cortex; and I think when we do we’ll get into more detail of some of these unconscious factors.

Thanks again for listening. I hope that you will visit the website at [brainsciencepodcast.com](http://brainsciencepodcast.com). If you aren’t subscribed to the podcast I hope that you will subscribe either through iTunes, through your feed reader, or even by email. All of these choices are available at [brainsciencepodcast.com](http://brainsciencepodcast.com).

And that reminds me of an announcement I forgot to make at the beginning of the podcast. I have been accepted as a station manager at Podango, which is a website that has stations where podcasts of similar topics and quality are gathered together. I am starting a station called “Science for Everyone” and I’m looking for independent podcasters who have science podcasts that are well rooted in the scientific method. So, if you know of a podcast that might be a good one for the station, let me know.

This does mean that there’s going to be a short ad at the beginning of the podcast whenever this is really up and running. I hope you won’t be too offended by this, but I put a lot of work into the podcast and this is just going to help me get a few pennies back.

As always you can send me email at [docartemis@gmail.com](mailto:docartemis@gmail.com). And I hope you will go to the new Flickr Group at [flickr.com/groups/brainscience](http://flickr.com/groups/brainscience). I’ll talk to you soon. Bye.

[music]

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Transcribed by [Lori Wolfson](#)

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