



Presidential Commission
for the Study of Bioethical Issues

TRANSCRIPT

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DR. GUTMANN: So we are turning now to our third specific topic, Neuroscience and Law. And we can take this work in many directions. But certainly some fundamental questions that involve whether and how to use neuroscience technologies in the courtroom. For example, what can neuroscience in its current capacity tell us about whether any individual is legally blameworthy for his or her actions? What is the potential for neuroscience to answer this question? What can it tell us about moral responsibility and blameworthiness as distinct from legal responsibility and blameworthiness? Those issues are out there and debated. And there are many others.

And I'd like to ask Nita to start us off here, and John will or will not -- John has to be on a dissertation discussion. But again, after that we can all engage in discussion and think about how we want to frame this topic, what we want to include and not include, because all of these topics are vast and we want to focus on what we can be most edifying about and most productive.

And I'll ask again to focus on two questions: What should we say about the issue in the report, and what specific recommendations should we make.

So, Nita, take us away.

And I'll keep track of the time again. We started at 2:20, so we will go on to -- we will spend at least an hour on this.

DR. FARAHANY: Since we haven't had as much of a chance to talk about the different issues in law and neuroscience, I'm going lay out first some of the things we could say about the intersection between law and neuroscience and then make some suggestions for areas that we could focus recommendations around.

So the first and one that we did hear some about is its use in the legal system, and in particular in courtrooms. It is showing up, neuroscience, in a lot of criminal courtrooms. This is something that I have been studying for quite a while.

And looking at the trends in the U.S. and across the world, it is primarily criminal defendants because of rules of evidence coming into the criminal courtroom and bringing neuroscience to try to substantiate claims in several different ways: to substantiate claims about their competency to stand trial, or competency to move to sentencing, or capacities similar to the conversations that we had before.

They are using it to challenge their guilt by challenging our traditional notions of things like what a mental state means and what it means to act voluntarily and so trying to argue that neuroscience shows that our ways of measuring that in the past are replaced by neuroscience.

And it's been used quite a bit in sentencing to try to challenge whether or not a person who has some sort of brain abnormality is as morally blameworthy as a person who doesn't, or at least who we can't detect who does, and to argue that therefore they should be sentenced differently or that we should replace systems like retribution with rehabilitation or preventative detention.

It's also been used for predictions of future dangerousness. And so when it has been raised by criminal defendants, prosecutors have seized upon it and used it to try to argue the double-edged potential of the evidence to say that a person who can prove that they're more impulsive than most is a greater danger to society and one that we should think about locking up for longer.

And it's been used as a proposal for treating anti-social behavior and for being able to come up with novel treatment modalities, whether it's for moral enhancement purposes or simply treatment of anti-social personality kinds of issues that might arise.

In the other part of the legal system it is starting to creep in quite a bit in the civil context, not just in the criminal context. And this is to do things like establish what I would call invisible injuries. So in the past it has been very difficult to be able to prove that a person is suffering from a headache or suffering from pain or truly experienced toxic exposure, and trying to use neuroscience as proof of those things and to say, look, here is the signature of pain or the signature of headaches or the signature of other types of toxic exposure that I've tried to prove in the past.

So that's the kind of broad strokes in the legal system, in the courtroom.

The second is it is coming into policy-making. And it's coming into policy-making -- and I'm laying these out here without any sort of good or bad, because when I get to recommendations I'll give a little bit of perspective on these things.

But in policy-making, a very stark example of where it is coming quite a bit is in fetal pain legislation. So in a number of states that have sought to or have enacted bills to try to move the point of an abortion and try to argue that an individual should not be able to have an abortion after 20 weeks, they have used neuroscience of pain to try to argue that 20 weeks is a better cut-off point rather than viability, and to say that there's a different compelling state interest rather than viability that should be taken into account.

And what's interesting is to look at the preamble of a lot of the legislation in different jurisdictions to see that they are citing neuroscience and relying very extensively on

neuroscience, and confusing some fundamental concepts, like the difference between nociception sensation, which is the body having some painful stimulus applied to it and reacting, versus perception, the ability to actually perceive and experience pain. And that's created quite a controversy about the use of neuroscience as a political tool.

That's the most stark example, but it's coming into other areas of legislation as well, and policymakers are turning to neuroscience to substantiate different types of things that they are trying to do.

A third area is in the context of constitutional law. And this, again, has beared on questions of culpability so the U.S. Supreme Court has cited to neuroscience in several major cases dealing with adolescent development to argue that under the Eighth Amendment of the U.S. Constitution, which prohibits cruel and unusual punishment, that individuals who are considered to be juveniles or adolescents don't have fully developed brains and therefore it's cruel and unusual to execute them or to give them life without the possibility of parole if they have not committed a homicidal crime, and have mandated in homicidal crimes that neuroscience be taken into account in determining the sentence of those individuals.

That's remarkable that neuroscience has been mandated. It has been mandated in some other cases, as well, like death penalty cases where it is considered ineffective assistance of counsel for failing to investigate a person's potential for having some sort of neurological disability.

It is also helping us to see gaps in constitutional protections, like whether or not there's such a thing as freedom of thought that underlies the First Amendment, freedom of speech, and whether or not some of the new technologies which might enable us to get at being able to reveal

visual imagery in the brain or other things like that have any constitutional protection. Likewise, what we mean by searches and seizures under the Fourth Amendment. What we mean by self-incrimination under the Fifth Amendment.

There's been considerable scholarship on these issues that people have been writing about. And the idea is neuroscience may help us see some of our shortcomings in types of protections we have considered as we are able to detect more than we could in the past.

And the last category is in trying to improve accuracy and decrease errors in the legal system. So for example, we are able to see a lot about biases in our decision-making that we couldn't previously truly detect. And there have been psychological studies that have gotten at this for a long time, but there's some really terrific neuroscience studies that start to help us understand the difference between in-group and out-group identification, which is a big problem in the legal system when you have different ethnicities and ancestral backgrounds serving on juries with – against a person who is a defendant; helping us to understand juror bias, judicial biases; whether or not a person who has lunch makes different types of sentencing decisions before lunch or after lunch.

But also things like limitations on eyewitness testimony. We have known for a very long time that eyewitness testimony leads to a lot of false identification, but being able to see some of the limitations of memory through neuroscience is helping to reveal the black box of memory that we previously didn't understand.

And people are making a lot of proposals then about how we might use neuroscience to improve accuracy and decrease errors in our legal system by being able to better understand decision-making.

Those are four major categories I would just lay out for us to discuss. And I'm going to turn to specific ideas for recommendations that would build on those areas. And there may be more areas that we want to discuss.

So the first, consistent with what we have said in every category, is the need for education, so what neuroscience can and can't tell us. One of the problems in a lot of the neuroscience in the courtroom is that the public has very little understanding, and even scientists have very little understanding of what we can say about individual causes of behavior. We might be able to see across a broad spectrum of individuals that some abnormality is correlated with some increase in impulsivity, but that doesn't tell us why a particular person behaved the way that they did. And being able to understand those limitations and educate the public about what neuroscience can and can't tell us is essential.

The second is a caution about the dangers of overstatement of science and the ethical implications for the progress of sciences. When we start using a science like neuroscience to predict behavior, when we can't yet do so, it has a problem of the credibility of the science as a whole, which can derail the science quite a bit and can slow the progress of science down quite a bit.

And so recognizing that the media, that people who report about science, that scientists themselves, that lawyers and judges have a duty to tread carefully in an area of nascent science I think is incredibly important to ensure the progress of this.

And along those lines, I would suggest that we consider recommending somebody like the National Academies do something like a forensic report on neuroscience and its use in forensic settings much like they did for forensic science in DNA and polygraphs and other types

of science. I think this could be useful as a way to try to have a high-level look at what neuroscience can and can't tell us.

The third is the importance of education not just for the public but for policy and legal decision makers about neuroscience. So the Federal Judicial Center has been excellent at convening a number of different neuroscience-for-judges seminars. We don't have similar type of education for policymakers. And they are turning to neuroscience, like in the fetal pain legislation area. A lot of judges have come through different training programs through the FJC and through partnerships with places like the Dana Alliance and AAAS, but it's short of what we need and they don't have adequate funding to do so, and it's essential that we get better education of those key decision makers.

Fourth is to encourage scientists to engage. So countless times we hear scientists who say they don't want to get involved in policy or legal decision-making. And it's understandable because a lot of times their science is misused. But the problem is it's the least credible scientists then who are the ones who are engaging in decision-making.

And so I think encouraging mainstream scientists to get better engaged with decision-making and to give them the tools to do so, to give them the public communication tools and the decision-making tools and the type of skills that they would need to engage in those settings.

I promise I'm almost done.

Fourth is -- no, fifth now. Fifth is to recognize that science doesn't answer normative questions for us. So in law, questions about why do we punish and why are people responsible and why aren't they responsible are normative questions, they're social questions. And science

can help us answer questions that are normative questions, but ultimately we have to bridge this gap that exists right now.

There are a lot of neuroscientists who write provocative articles about how neuroscience changes everything and utterly derails our conceptions of free will and conscious awareness and retribution and punishment and everything else. And the truth is it doesn't. It may help us better understand the underlying biological and neurological contributions to behavior, but it doesn't answer for us why we punish people or why we hold them responsible.

And the last one I would raise is to recognize the unique issues that may arise from treatments of vulnerable populations in this setting. So we have forced competency in a number of jurisdictions. There's forced competency to render a person able to be executed. There are proposals for electronic monitoring of people using different types of medical treatments based in neuroscience, or trying to do things like -- instead of electronic sentencing to have medicalized options for prisoners.

So for example, if you gave a person an option which is you can have this type of drug that you stay on or parole -- with parole, or you stay in prison, that that's oftentimes an incredibly coercive and difficult choice to make.

And in this area more than any other one, I think when we are dealing with issues of cognition and personality and personhood, that we have to be more sensitive than in some other areas about treating such individuals in such ways, and we need to recognize that there may be a broader liberty interest at stake when it comes to issues that touch on our personalities than in some other types of context that we have thought about punishment in the past.

So hopefully that gives us some fodder for discussion and to get things rolling in this area.

DR. GUTMANN: That's terrific. Really terrific.

Again, I think as Steve and Christine and Dan and Anita did, this is an excellent outline which we can then put more flesh on. But these are really good bones for it, really.

So open it up for questions and comments on any of these categories.

Raju will start.

DR. KUCHERLAPATI: Nita, that's great.

I want to ask you about this issue of culpability that you talked about. And as you know today, in cases of murder, or something to that effect, you know, if a person is considered to be mentally impaired, that they would not be considered to be culpable in the classic sense of other people. And I was wondering that as we gain our understanding in neuroscience and maybe the genetic basis for many, many behavioral disorders that could be considered to be criminal, would that help the law? Or like you're talking about, law is a social construct and this doesn't really make any sense?

DR. FARAHANY: So since John isn't here, I will also incorporate what he was going to say because this is an area that he is most interested in for the law and neuroscience issues, which is traditionally our legal system in this country has been based on retribution and the idea that the degree to which you punish an individual should be proportionate to the harm they have caused to society, and their own moral culpability.

And much of the early debate in law and neuroscience focused on whether understanding some of the genetic and neurobiological contributions to decision-making would undercut the moral culpability of the individual and force us to re-imagine or reorient the legal system entirely.

And I'd say there have been long-standing debates about retribution that this doesn't change. We have, for centuries, understood that people have different capacities and that people have mental illnesses and mental impairments and impairments in decision-making and judgment that lead them to act in ways that are anti-social. And the way that the justice system has been oriented is really around the average person, to say that this is a system that's designed to try to have some form of social control and some form of social norms that we enforce and we recognize that some people will be more capable than the average person and some people less capable than the average person and some people who we will consider non-agents, and those are the people who we will call legally insane.

Does this expand the category of the legally insane to say everybody is legally insane, so none of us are agents of action? That's inconsistent with our experience of who we are and inconsistent with a lot of the utilitarian science that shows holding people responsible has socially beneficial consequences of making them act in more responsible ways.

So does this fundamentally change the long-standing debate about moral responsibility and retribution? I don't think so. It gives a little bit more fodder on the side of neuroscientists argue that, look, we are automatons who are entirely determined, and on the other side to say that isn't consistent with our experience of self and person and responsibility. And ultimately science isn't going to answer that question for us.

Can it lead us to some better results? It might. We might discover that incarceration is wholly ineffective for what the social goals are that we are trying to achieve and there are better ways to achieve it, or it might not.

But it's not going to force us to reorient our legal system simply because we now have a better understanding of the neurological and biological contributions to behavior.

DR. GUTMANN: Yeah, I completely agree with that and I think it is worth saying because it also scares people unnecessarily about neuroscience and it leads them to think that these issues are simpler than they are, because there are many pieces of evidence before neuroscience to suggest that some people are more capable of impulse control than others. And some people are very incapable of it. But there's nothing -- despite the fact that we knew that, and we have never known how to totally or mainly cure it, the law still has this standard that we are going to hold people responsible unless they are legally insane, and then we put them in a mental institution.

So I wanted to follow up on what more can and should we say about science does not answer normative questions but it can help. Because this, I think, is part of the theme of the integration of neuroscience and ethics. And I think we should definitely say it doesn't answer these questions but equally definitely say, but it can help. It can shed light on some of the issues that we are dealing with as a society in holding people responsible, in incarcerating people, in what our expectations are for rehabilitation versus punishment.

So what -- and I think there's some really interesting evidence and some really interesting ethical argument that can help us here. So maybe you want to say a little bit more on this because I think this is -- all of the things you have said I think are worth our saying, but I think

this is a sweet spot for this Commission to shed light in a very both positive and critical way on the intersection of neuroscience and the law.

DR. FARAHANY: I think here examples are the most useful thing to help people really understand this point. And I think incorporating into our report examples will be useful for doing so.

This isn't different than any kind of evidence-based decision-making or evidence-based policy decision-making, which is to say, it can be extremely useful to bring in science into policy decision-making and legal decision-making where oftentimes we are using folk psychological evidence to make those types of choices.

So to give just a few concrete examples, one would be competency determinations. So if we could actually get at what we were talking about in the last session, capacities to remember things which are necessary to assist in one's defense, being able to turn to neuroscience to help inform -- you know, first say, here are the capacities that we are interested in that are relevant to whether or not a person is competent to stand trial. Can science tell us and answer any of these pieces for us, like the person's memory about the events that occurred, the person's ability to exercise good judgment or reasoning? Those are really useful questions.

On incarceration, how useful is incarceration for the goals that we are seeking to serve? If the goal we are seeking to serve – and again, this forces us to articulate what are the goals, which is one of the useful functions of bringing neuroscience into the legal system. If incarceration is meant to simply preventively detain people and keep them away from society, neuroscience doesn't help us answer that question. It as an entirely normative-based choice.

If it's meant to do something more like rehabilitate or change someone, looking at some of the neuroscience of what solitary confinement does to an individual, how it changes the brain, how it might actually worsen a person's ability to reintegrate into society are useful evidence-based, empirical types of issues that can be answered.

So I think what neuroscience is helping us to do by forcing the issue is to articulate what do we mean, what's the purpose and the goal? What do we mean by voluntariness for actus reus as one element of a crime? What do we mean by each of the things? Come up with what the normative baseline is and then see where there are gaps in our knowledge that can be improved through neuroscience and other types of scientific information.

DR. GUTMANN: Dan. And then, John, I'll ask if you want to say a few words.

DR. SULMASY: Yes, just to quickly answer that.

Yes, I think it's part of the dialogue that I think Raju called for and you called for as well, in which even the standards you, for instance, set for what it means to have capacity are really normatively determined, and then we are simply looking to science to see if there are ways to help us answer that in a particular case. So it's a dialogue that way which becomes, as Raju said, the best example of working together.

DR. GUTMANN: And –

DR. KUCHERLAPATI: Can I just make a comment?

I'm not completely satisfied with the argument, so let me -- science, I believe, should and has informed -- not informed the law, but actually changed the law. If we think about fingerprint evidence, that wasn't always there. But fingerprint evidence really changed the way that we all

think about this. And like you talked about, forensic science has profoundly affected the way the law has changed, right? It takes into consideration and so on and so forth.

So why are those examples different than, let us say, a genetic basis for a predisposition to arson or some other things? Why shouldn't they be considered in law? And I'm not asking -- we're not the people to make that decision. But why do we give up on that?

DR. FARAHANY: To be clear, Raju, I'm not saying that they shouldn't be used. I'm saying they are different in the ways that they should be used. So for forensic DNA, which is meant as circumstantial evidence about whether or not a person was, in fact, present at a crime, when the prosecution wants to establish their case they have to come up with a number of different pieces of evidence to prove beyond a reasonable doubt that it was that defendant who did that thing that we are talking about. And science has been useful in telling us it was that defendant who did that thing.

And it wasn't there before but the questions were there before, which is, was it that defendant who did that thing and does the science inform that?

I mean, questions about behavioral predispositions, they can have some relevance. So for example, there is a normative standard for legal insanity. And a normative standard for legal insanity is not a medical definition, it is a legal standard. And it says because of a mental disease or defect, was a person unable to know the difference between right and wrong? That's a legal standard for which science can inform it; does the person have a mental disease or defect? And better science can help us inform that one prong.

But the legal standard gets to the question of who do we think are non-agents to whom the requirements of criminal law shouldn't apply in the traditional way because we think it would

be unfair and unjust and undermine the legal system. That's a very different normative question than was that the person who was present at the crime scene who committed the crime.

DR. GUTMANN: Some legal questions are purely science based, evidence based, and others are ethical. The standard of culpability is an ethical standard. And science by itself can't change that standard. Knowing the difference between right and wrong, the capacity to know the difference between right and wrong is not the same as the capacity to control your impulses. You don't need neuroscience to know whether someone has the capacity to tell the difference between right and wrong, but neuroscience can help in that. It can add more evidence.

But there's no basis in science for telling us whether that standard is the right standard. And there are many arguments for and against that. I mean, you could argue for and against that standard, but it's not science.

And I think what Raju is raising is important because we are a Bioethics Commission. If there were no independence of ethics from science, you wouldn't need a Bioethics Commission. You would just need a science commission. But almost every issue -- this is important, I think, for us as a Commission.

Almost every issue we have been assigned has been pored over by scientists or doctors and so on. And we get assigned it because there is a broad recognition in government and in the public that there is a difference between science and making ethical decisions. Sometimes I think there isn't enough recognition about how the two should work together. And that's just a broad statement.

I was going turn to John, but knowing that Nita represented your major concerns.

DR. ARRAS: Good. So I want to apologize to everybody. My day job was calling.

So I think that when we address this kind of an issue in a report, a good place to start is with what Aristotle called the doxa, you know, like what people are saying. What are people talking about? And one thing that people talk about in this connection - and we get this from Josh Greene at Harvard and his colleague, Cohen, at Princeton, and a bunch of other people, Sam Harris in the more popular literature - is that according to what neuroscience teaches us is that free will is an illusion and that we need to really get rid of folk psychology which involves intention and belief as motivations or causes of action.

So that's really a very broad-based assault on our notions of law and our assumptions about what people are like, the people who are governed by law. Okay?

I'm sure Nita did an excellent job of laying this out. But law traditionally assumes that people are persons, agents, responsible. They can guide their decisions by rules and so forth. And a lot of this literature just tries to debunk that notion in the service of a kind of therapeutic preference, right?

So Josh Greene is arguing that since hard determinism is true, we need to get rid of our retributivist system of criminal punishment and substitute a more forward-looking consequentialist, therapeutic, if you will, approach to crime.

Now, that's one way in which neuroscience has been brought to bear. There are other less radical ways. Steve Hyman at Harvard who was a phone contributor to one of our meetings, Hyman has written on addiction and argued that the more we learn about the brains of addicted people, the more we see a kind of neurological rationale for that. And he thinks that that should lead us toward a much less retributive approach toward the addict.

So those are two different sorts of approaches. But both of them, I think, raise the question that you folks were just discussing, which is how much neuroscience can tell us about legal -- normative legal standards.

Even if you can show that there's a causative relationship between brain function or brain structure and various kinds of criminal behavior, that doesn't tell you whether people should be held responsible in law for that, right?

So I think that if we are going to engage with the doxa, we need to engage with the popular imagination about these issues. And that's where a lot of it is.

I will say one other thing, and that is that in view of all this literature which is espousing a therapeutic approach to crime, I'm just stunned as a veteran of the debates in the '60s and '70s over people like Karl Menninger and others who are proposing exactly the same thing, right? And there was a vigorous and I think very robust backlash against that, certainly in philosophy from the likes of people like Herbert Morris and others who argued that the therapeutic approach really strips citizens of their personhood and it views people as things to be just moved around and not responsible for their actions.

So I think that that is something to worry about if we want to go down a therapeutic path. Strawson talks about this and Morris as well.

So one other thought, but I can't retrieve it now. It's okay.

DR. GUTMANN: I want to say something about that, give an example of how there are some debates in which we talk a lot about scientific evidence and ethical reasoning. Part of ethical reasoning is just logic, okay?

There's something illogical about some of these arguments. And let me use an example which is also a neuroscience example to show about holding people morally or legally responsible.

So there's a lot of, in the news of late, of sexual assaults on college campuses. And some fraction of those assaults happen under the influence of alcohol. And we know from neuroscience evidence that once under the influence of alcohol, the prefrontal lobe doesn't work to control impulses and crimes are committed. There's no logic that says because somebody is under the influence and can't control his impulses he should be treated more leniently.

Take, you know, automobile accidents. We come down very hard on drunk drivers. At the same time, we know and neuroscience affirms that drunk drivers are less able to control their impulses and less able to have socially constructive behavior.

So it's just illogical to say if we find out that some people have less impulse control then we should hold them less morally culpable.

Now, there are some views of moral culpability which say -- which are predisposed to say the only time you should lock somebody up or limit their liberty is for deterrent reasons. But that's an ethical argument, not a scientific one. Whereas there are many arguments -- I'm not taking one side or another, I'm just making logical points. There are many arguments that say whether a person could control his - I'll just use the "he" here - his impulses or not, we as society should hold him responsible for it. That's the only way you can have a rights-based society of mutual respect.

So I wouldn't -- so my conclusion of this is to -- you weren't here when Nita gave her presentation, so I think it's really important to underline what Nita said which is core to the

Commission. We should not throw the neuroscience baby out with the bath water. That is, there is bath water, dirty bath water here, but there's a lot of positive that neuroscience can tell us in this domain and we should clear the way for that by criticizing the unsubstantiated leaps, and sometimes they are purely illogical leaps, and then show what neuroscience can contribute such as under what circumstances does rehabilitation work better or worse.

DR. ARRAS: Yeah.

DR. GUTMANN: Not -- and the only added thing, and then I will be quiet.

DR. ARRAS: I want to follow up.

DR. GUTMANN: The only added thing I would say is we should also indicate that in many of these cases it is neuroscience pairing with some other science. It's often not neuroscience standing alone.

DR. ARRAS: Right. Just to follow up a little bit. Your colleague at Penn, Stephen Morse, I think he is a very sane commentator and a really beautiful writer. Morse has this great line about brain over-claim syndrome. He says this is brain over-claim syndrome. People going off the deep end from one or two experiments, concluding that free will doesn't exist.

But so I think I have retrieved that thought that was getting away from me. So people like Greene argue that neuroscience gives us increasing confidence in the -- you know, in the thesis that free will doesn't exist, right?

So that leads to an ethical judgment on his part that it's unfair to punish people, right? And leads to the final conclusion which is that a more humane approach to this is a therapeutic handling of people.

And I just want to point out two downsides here. One is the one I have just mentioned, which is viewing agents under the law as no longer really agents. Okay. That would bring about a profound change in the way we view each other, right? The other is that the notion of mandatory treatment, it really is discordant to my ear for sure, you know.

And I can imagine courts ordering all sorts of invasive brain examinations on people against their will to determine if they are still a threat. There are worries about preventative detention and so forth. This is not as humane as it might at first appear.

So anyway, but I think these are all issues that ought to be addressed.

DR. GUTMANN: Jim?

DR. WAGNER: Thank you both. Great presentations.

In the spirit of trying to harvest out of each of these examples some of the fundamental principles, I think what we've been talking about most recently in response to both of your presentations has to do with principles of autonomy and self-determination: Did I do it or did my dysfunctional brain make me do it? What about privacy? Does that come in, Nita, in self-incrimination? Do I have a right for you not to invade and know that I actually did it?

DR. FARAHANY: So the reason I only – I will first answer your question and then I'm going to respond to something of the previous conversations.

So the reason I didn't put that on our list of law and neuroscience is there are kind of concrete things that are happening today and then there are some of the fears about ways in which neuroscience will be used in the future. And I have written about this, the fears of ways in which neuroscience will be used in the future, like being able to take somebody who has

committed a crime and without their consent being able to reconstruct the visual imagery that's in their brain of the, you know, night of the crime. These are things we can't do yet, but theoretically possible in light of emerging science.

And then I look at our privacy laws and issues around freedom of thought and self-incrimination and conclude if we were to apply literally the doctrines that we have today, the answer would be no, none of those things would be protected because they're physical things you're taking from your body. And the way we treat physical evidence from your body is very different than the way we treat forcing you to speak.

The questions of autonomy and personhood I think are raised by many interventions in neuroscience, whether it's in the legal setting or any other setting. Whether in the workplace setting, you know. Being able to detect information is much like we looked at under the genomic science report which is can your body reveal things about yourself that you wouldn't want to reveal about yourself?

And I think we're going have to, as a society, come to terms with the fact that this is maybe the kind of last bastion of freedom, is being able to keep your thoughts private. And in every other area we're getting closer and closer to transparency. And how important freedom of thought may be to democratic systems, to the ability to have creative ideas, to the ability to think bad thoughts sometimes about your spouse without them knowing it and have harmonious relationships. I mean, basic ideas of who we are as people. We're not there yet. We are far away, actually, from being able to detect our thoughts without our consent.

There's so many easy ways to prevent that from happening. And we're so far from being able to remotely detect your thoughts and your visual imagery that I'm not as concerned about it

today. But I do think it's ripe for us to think about whether or not there's some sphere of autonomy that's impinged upon by forced drugs, by trying to get at recognition which is going to be much faster than picking up visual imagery in your brain.

On the second point, which is the points that John is raising. So, you know, I think these are incredibly interesting conversations. And of course that's part of why I say it's raised as issues that are useful for us to canvas. But as a Bioethics Commission, we're not going to resolve these age old disputes about retribution and whether or not neuroscience changes everything or nothing at all.

But I do think it is useful for us to state that these are normative questions and that, as Amy pointed out, recognize that science can help advance those questions but that they don't answer those questions for us. And so simply to lay out what some of the debate is, but to say science hasn't changed what our normative questions that we, as a society, have to come to terms with and grapple with.

One thing I would say that science can do for us beyond just informing those standards is sometimes help us see when we have gotten standards wrong. So if we have based something on, you know, an ordering of mental states that turn out to be flawed, sometimes neuroscience can help us see where we got things wrong, if those were the bases of our normative decision-making, but they are not going to replace normative decision.

DR. GUTMANN: Yes, Christine.

DR. GRADY: Thank you both. It was really interesting.

I'm wondering, based on what you just said, Nita, whether there's anything that we could or should say today about what research gets done or how it's prioritized or something like that. I was thinking about the example you gave about freedom of thought. Okay. Maybe we can't do it yet but probably some day we will be able to.

So the question is that so counter to the way we want to understand people's freedom that we shouldn't even be doing that? I mean, I'm not sure I believe that. I'm just wondering what you think about whether it has any implications for what we say today about the research.

DR. FARAHANY: I wouldn't say that any of the research is off limits. I don't think that it is unethical research. The types of research that some of the extraordinary scientists are doing, like Jack Gallant, who is reconstructing visual images in the brain or reconstructing language in the brain, helps us understand how we process information and how we hear information and learn information. So I wouldn't want to say that we should stop that kind research from going forward. It can be useful to be forward-looking, right? And to be clear -- and I think it is incredibly useful in a report like this to be clear about the limitations of science today. But imagining some of the applications that we could reach, because we will get to the point where we can reconstruct the visual imagery in your brain, we will get to the point where we can reconstruct recognition of a face in the brain. We are already getting close to that kind of stuff.

And so suggesting that it would be a useful and fruitful area of further discourse and conversation and exploration, which is recognizing that this research is going forward and may open up new concerns about privacy that may be different in kind rather than just degree, and may breach a barrier that up until now we really thought was safe, is useful to highlight and say this is probably an important area as the BRAIN Initiative and other neuroscience goes forward;

to prioritize, to come up with what some standards might be around freedom of thought or cognitive liberty, is what I've been calling it, as kind of a broader term to encompass self-determination and autonomy and mental privacy that might be included within that.

DR. GUTMANN: Dan.

DR. SULMASY: It strikes me that it might be helpful, in looking at a lot of the science and the claims of neuroscience, to try to point out that most of what even somebody like Josh Greene is talking about are actually predispositions rather than, you know, irresistible hard compulsions which cannot possibly be resisted at all. Because, again, that leaves the possibility for freedom. We didn't need neuroscience to know that human beings have a tendency to be selfish, right? Believe it or not, right? Doesn't mean that we cannot exercise agency over and above that predisposition freely to control our behavior? So flagging that might be helpful in terms of partially clarifying some of this.

DR. GUTMANN: It's also helpful to say - and again, this is factually the case - that to believe what you've said is consistent with believing in determinism, that I don't believe that anything doesn't have a cause, that we are talking about. It all has causes. So there's nothing -- you know, all of what we --

DR. SULMASY: Compatibilism, not hard determinism.

DR. GUTMANN: Well, everything that we do has some cause. It's the question about whether we should be held responsible is not based on whether the things we do and say are caused. It has to do with what we say and do, and in the case of the legal standard whether we are able to know right from wrong. In the case of many other things, even if we don't know right from wrong, we are held responsible.

So again, I think it's important for us to say it's just as important for -- we are in a good position, since we are going to recognize how much neuroscience has to contribute, for us also to say that it's important for neuroscientists to recognize what they can't responsibly come to a conclusion about.

Now, for those who don't believe in responsibility, it will be irrelevant. But it is important for the progress of science, it has been really important moving forward to have wise scientific spokespeople for that science.

Raju.

DR. KUCHERLAPATI: I think perhaps –

DR. GUTMANN: Hold on. I'm sorry. Raju and then Anita.

DR. KUCHERLAPATI: It may be possible to be able to separate these two sets of issues. And one is whether or not -- you know, I guess we get stuck in this view, western view about determinism and that's absolutely bad. But genetics tells us otherwise, right? If you think about many different things, you know, there are certain types of mutations that people are born with and they get Huntington's disease 100 percent of the time. There are certain types of mutations that people inherit and 100 percent of the time they will end up with colon cancer. All right.

So it is possible that many of these behavioral types of issues that we are talking about, many of the neurological issues would also have a genetic basis. May not be a hundred percent. But whatever it is, right? So we could recognize that and neuroscience clearly is going to help us understand it.

The second issue -- I've been listening to everybody, I understand it -- but how that information is going to inform law might be separate, right? And I would say that if you would say that, you know, law has nothing to do with science, it's a social construct and we would make determinations on that basis, that's fine. That's okay. That's how the society might decide to make those decisions, right? So it is possible to be able to separate them and you don't have to say that, you know, whatever predisposition or something doesn't exist. They do exist.

DR. GUTMANN: Anita.

DR. ALLEN: Well, I'm glad that, Raju, you made that point that you just made because I find myself feeling more empathetic towards people who are ill and people who are criminals because of my knowledge of what the scientists are saying about DNA and the brain. I honestly feel more empathetic. I feel less like pointing a finger of blame and shame.

So it does seem like on some level, despite the correct -- I think the correct viewpoint that Stephen Morse and others lay out, I think despite that, some of us are feeling that we want more to help and to rehabilitate and to empathize with as opposed to throw in jail and punish. There is -- science is having an impact on how we feel about our own criminal justice practices and our own ethical practices, as well.

But what I wanted to say primarily has to do with -- I guess it's kind of a question for Nita. I wonder whether we are at a point where we could recommend that the criminal justice system rely more upon brain science in constructing humane forms of punishment. Think about the SuperMax system. So now more and more people spend their time in jail in isolation and there's a lot of sensory deprivation, social isolation.

And there is pretty good evidence, I think, I'm reading studies saying that this increases mental illness, it makes mental illness worse. And yet the prisons keep getting built and people keep being thrown into SuperMax. It's an efficient way to deal with imprisonment.

So are we able to say sometimes that we ought to change our criminal justice practices in light of what neuroscience in particular tells us?

DR. FARAHANY: Yes and no, is what my answer to that would be.

So one area that I think that neuroscience could fruitfully help is in bringing more evidence-based decision-making policies. And I think that's true not just of neuroscience, but to Amy's point, many different types of science can be incredibly useful in having better evidence-based decision-making and policy-making.

And whether or not neuroscience can give us adequate information to figure out what the best forms of punishment are today, I'd say the jury is still out because there's some neuroscience about at least the effects of things like isolation and the detrimental effects of isolation. And given what we may be trying to achieve, it may not be effective. And so in that way policymakers should look to science to inform and make better choices about policies.

The value of neuroscience in a policy-making arena instead of in an individual case-by-case basis is we can't say very much about why a particular individual behaved the way they did by looking at their brain or looking at their genes. This is the generalized ability to individual problem in science. These are population differences rather than individual differences. But if we know that particular groups respond in particular ways and we are trying to fashion policies, there it can be far more useful than an individual court case.

So I don't think we are in a position to say, hey, criminal justice system, you need to change your punishment. I do think we are in a position to say, hey, policymakers, there's some really good science out there that may bear on decisions about particular forms of punishment or effectiveness of different types of strategies we are using in the legal system, and here are ways to educate policymakers to bring more evidence-based decision-making and empirical decision-making to bear on those types of questions.

DR. ALLEN: That's really what I was getting at. I think that kind of recommendation would be really, really useful.

DR. GUTMANN: Good.

I think we are – the three topics -- have done them justice, if you will. And I want to thank Nita and John and all the Commission members for a very fruitful afternoon. And let me just also thank our speakers, our earlier speakers for really contributing to our deliberations.

And I know this is also webcast, and we invite anyone to write us with any comments. And you can submit your comments on our website, bioethics.gov.

And then I ask everybody to join Jim and me tomorrow at 9:00 a.m. as we will begin our discussion on our new project, deliberation and bioethics education with a special focus on preparedness in public health emergencies.

So we will have with us tomorrow, virtually at least, Drs. Larry Gostin and Tony Fauci.

And with that, I'm going to ask Jim if he has anything he would like to add.

DR. WAGNER: Only that in our 19 meetings it's rare we have had such a period to deliberate amongst ourselves. As much as I appreciate having the terrific folks to come and speak to us, I appreciate also this time. So thank you all for your engagement today.

DR. GUTMANN: Here, here.