Q&A with Profesor Robin Palmer
Conducted by Dr. Francis Shen, September 2020

Note: This Q&A between Professor Palmer and Professor Francis Shen is part of the 2020 International Neuroethics Society Annual Meeting session: ***Policing, Neurotechnology, and the Search for Truth***

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TRANSCRIPT:

Dr. Shen: Welcome to this video, which is part of the upcoming panel: Policing, Neurotechnology, and the Search for Truth, part of the International Neuroethics Society annual meeting and we hope that you'll come and join us for the panel on October 23rd after seeing what will surely be an exciting conversation with my special guest today, Professor Robin Palmer. Professor Palmer is the Director of Clinical Legal Studies at the University of Canterbury in New Zealand, and has many talents and many points of expertise but will talk to us today about his really pathbreaking work in doing forensic testing and exploring the potential forensic use of brainwave analysis and brain fingerprinting. He published, a few years ago, an important and provocatively titled article, "Time to Take Brain Fingerprinting Seriously: Consideration of International Developments in Forensic Brainwave Analysis," and he will talk a little bit about that work and about their ongoing work. Professor Palmer, thank you for joining us.

Professor Palmer: My pleasure, Francis.

Dr. Shen: So could you first, just give us a little bit of background on your research and your approach to this technology and how it is you came to be interested in mind reading in brainwave technology?

Professor Palmer: Well, prior to coming to New Zealand, I was a Professor of Law at Durban, South Africa, the University of KwaZulu-Natal, and we ran, me and a colleague, in practice, ran a forensic investigation Post Graduate Diploma for 20 years. And part of that diploma was looking at all kinds of investigative tools for lie detection, starting from facial recognition and from demeanor and polygraph and all the ones that, voice-stress analyzers, and all the ones that have developed over the years, and in, as part of that course and part of the research and also being a practicing criminal lawyer, I've done over 240 murder trials alone, which, probably indicative of the murder rate in the country at the time, but never mind. We became very interested in the development of forensic brain wave analysis, which is the generic term for

various kinds of brain fingerprinting, or other terms that I've used. But in the general rubric of forensic brainwave analysis, we then looked at all the current researchers and tests in the field, and from there we developed a research interest and research program, which started in 2016, and the first, the third round was concluded in the end of last year 2019, early this year, and so we had all series of experiments to try and verify two things. First of all, the accuracy and reliability of the technology. Although we had quite a few researchers also looking at the ethical and legal implications, all that becomes redundant if we have no faith in that the technology itself, it will be reliable and accurate. So in doing so, we investigated, we decided to focus on the originator of the Lawrence Farwell's CIT testing. He initiated it in the early 1990s late 1980s with Donchin, and then went to commercialize this technology. We started by trying to verify his version of forensic brainwave analysis. And in doing so, we met with him in Seattle, developed a relationship. He came out to Christchurch where I am based , and he was involved in the first two phases of the project, the third phase, which was an attempt at independent verification of his technology, he was not involved in. So he was, he trained our testers, he trained me. The first two years was really trying to understand exactly what the technology can, cannot do, strengths and shortcomings. And as part of the program we also visited Singapore and met the developers of the BEOS system, who came over from India to meet with us and spent a week looking at how the BEOS system worked in Singapore, and had a pretty good understanding what the BEOS people are doing. And then one of my colleagues in Canada was doing his PhD on Peter Rosenfeld's version, the CTP system. And he then came to Australia and I went to meet with him for two or four weeks in Australia where he was based at the Charles Sturt University, which is the university that runs policing programs, and he had just finished his PhD on the Rosenfeld CTP system. So we had a very good overview of the main players in the forensic brainwave analysis field at the time we did our experiments.

Dr. Shen: Yeah, you've just named, I think, all of the major players, almost all the major players in the field. I want to go back to something you said just to dive a little bit deeper. How are you testing the Farwell technology? A lot of these experiments have used something like a mock crime scenario. One of the challenges in forensic application, as you know, is moving from lab to real world and concerns about ecological validity. Of course, it has to work in the lab first. Can you say a little bit more about how you're developing your testing?

Robin Palmer: And it was an interesting discussion I had with Michael Finichelli who did the PhD, with the the Rosenfeld system. We had quite the robust discussion about crawling before you can walk and what have you. Because, we try to replicate, as far as possible, real world scenarios. In other words, rather than opening cupboards and looking at cupboards and trying to see what the brain recognizes what was or wasn't there, we tried to replicate, as far as possible, what would happen in a real crime scenario and in and try to simulate it, or not simulate that, duplicate that, with students. So in the experiment we did, one of our team members is Professor Richard Jones, who is linked to the New Zealand Brain Research Institute is also a professor, adjunct professor in six faculties, psychology, neuropsychology, engineering, and medicine so I got my expert of six people in one person as well as he's concerned. And being a scientist, he was, let's say, rather skeptical at the outset when we first started in 2016. It took me some persuasion to get him involved. But he's been part of team for three or four years and looking at everything we do with a very skeptical eye, but he oversaw all the scientific experiments. So we developed the research design, which is very, very close to real life testing. The final two

independent verifications or experiments we did, one was with 36 students at the university here. And what we made them do was each of the students had to think of a significant event, traumatic event, in the last five to 10 years that happened to them and we then interviewed them, identified the details of the event, and then put them in groups of four, and then of course we randomly selected one student's event and tested four people on that event to try and determine whether the technology could detect who was involved in the event to who wasn't. And although, well, some of the events were pretty close to crimes. One person had a very bad LSD experience and threw somebody through a wall, and one student was driving down to the South Island and smoking marijuana then forgot that she's supposed to be holding the steering wheel. So they were all kinds of very interesting traumatic events which are very close to crime scenarios, really. And, so, the first set of experiments was based on identifying those events. It was quite a lot, to-and-fro, confirming the research design for those. We had 22 iterations before the research design was finally approved. It took six months because of the ethics and the detail in making sure that the various scenarios were correctly captured. The second set after that was much more challenging. We had links with the halfway house for people who had committed very serious crimes and New Zealand murderers. Convicted murders who were going up on parole and sex offenders and typically people with rap sheets longer than about three or four pages over 20, 30 years. So we went from a very clean demographic of 23-year-old-average students with no drug and brain injury problems to a second demographic of hardened criminals. Skeptical. We couldn't even videotape them, they refused to be videotaped. They thought might be used against them in some future crime. So we had these two sets of experiments, back to back, one in the halfway house, the prison, and one at university, and we're busy analyzing those results now to see how they compare. And so that's where we are at the moment. So, we will have a pretty good picture at the end of this analysis about how accurate and reliable at least Farwell's system is because that's the one we tested on.

Dr. Shen: Sure

Professor Palmer: And so we are quite excited to see what, what comes out. We have, of course, indicative results which are very encouraging and I can say this stage at the results of the students were very, very good. And the results of the prisoners were less good, still encouraging, but there were other factors which one clearly has to be very careful of when we look at real life examples.

Dr. Shen: And were you showing words and descriptions of salient facts related to the events?

Robin Palmer: Yes, images, words, and descriptions on the computer screen, which is which is the Farwell system, in a tutorial in 2011, developed 22 scientific standards, what used to be 20, so anybody wanting to duplicate his scenarios or his technology would have to follow the 22 scientific standards. In addition to that there is a 74 page Technical Manual, which we had to follow. And then there's all kinds of other technical issues that in the course of the training and the planning came up, which we developed our own manual of troubleshooting. For example, you can't use steel chairs because that interferes with the signal so you've got to get wooden chairs. So it's all the bits and pieces which we learned as we went along. And, of course, the learning curve was quite steep but I think we did pretty well in the end.

Dr. Shen: For those, and just one more question about the study that you carried out, for those in the halfway house, did you take your equipment there? So they didn't have to come to the lab?

Robin Palmer: No, no. We brought them here under strict security so, it was, the ethics on that was quite mind boggling. The Dean was in a constant panic about, because remember this. The subjects are very unpredictable, very long criminal records of murder and they are quite impulsive. And we learned quite a lot from that. I'll give you one example. Each test typically takes three and a half hours to complete. It's a long test because it's got to be averaged, it's got to be repeated, you know. You'll be aware of the nature of averaging and bootstrapping and all the rest of it. But all the testers, whether it's BEOS, or Rosenfeld system, CTP system will tell you that what is crucial is to ensure constant concentration during the testing. And with the students who are used to doing three-hour exams, the concentration was not a problem. They could sit down for three hours and go through without any problem because of the discipline of writing exams and the fairly homogenous nature of the student population. When it came to the prisoner subjects, you had volatile people, people who are impulsive, those who refused to sit for longer than 10 minutes. In the end, we found that if we broke the test up into 45 minute-long portions and gave them cookies and coffee or milk in between, calm people down, enhance concentration. So we learned quite a lot, ideally, with different subjects. They definitely were much more challenging than the students and I would imagine against real life. Our next stage is to try and set up a lab at a police station, been negotiating with the police on that. And it's going to be a lot more challenging when it comes to ensuring concentration, which is the key to reliable and accurate results.

Dr. Shen: That is a wonderful segue to my next question. And the focus of a lot of this panel is police use of this potential or technology like this. How would you respond to concerns that many have voiced that even if it were in the lab, shown to be accurate enough, and you've reached enough sensitivity and specificity. In the hands of police, or the government generally, it could become dangerous, both because of lack of fidelity to the manuals, lack of attention, you know your research group, you just described, all of the work and time that went into both the preparation and then for each use of technology, you know, I mean you're really expending a lot of energy. So there'd be concerns about, can they actually do it, would they be motivated to do it, and would potentially government, police, use this technology in ways that would be problematic. I wonder how you would respond to those concerns.

Robin Palmer: Well, that that is a crucial question, because we know from, from the day they planted a glove in O.J. Simpson's garden and what have you, that we have to assume that there are going to be unethical law enforcement officers, whose primary motivation is to get a conviction based on a preexisting focus, rather than to keep an open mind. So we are strongly, I'm tending towards the very strong opinion, that it will be counterproductive to train police officials, law enforcement officials, to do this. Because the nature of, and it doesn't really matter whether you're elected or whether you are part of a flat structure like in New Zealand, the nature of your career priorities may just be such that you will, you may not be able to be completely neutral in the testing process. So I would strongly suggest that the testers should be independent of law enforcement and should remain that way. And if law enforcement is to be trained to do this, I suspect it will never be admissible in court. Because the dangers are just too, too great. I'll give you one example. Let's say there's a ring that's been stolen, which is very significant. Very

significant ring, very distinctive, and you know if you have that ring as an image on the computer screen, it will immediately provoke a P 300 response, which indicates recognition. Now an unethical law enforcement officer could go to the cells where the suspect is held and show him the ring and say "look at this." And once that's imprinted on the brain, and that person gets tested, of course it's going to come up positive as a recognition response. Now to explain to a jury, we still have juries in New Zealand, and of course most American jurisdictions have the same problem, and how do you, how do you prevent that false recognition, based on the integrity of the law enforcement officer, from contaminating your results? So I think there are really big ethical concerns in the application of this technology. As I said, our primary motivation was to first satisfy ourselves independently. Is it worth carrying on looking at this stuff or was it just too unreliable? And that's what our first focus is, but we are aware and have been aware and have been doing research on the ethical and legal implications of what we're doing as well and there are real concerns when it comes to that.

Dr. Shen: So it sounds like you feel there is at least reason to take the next step and keep exploring empirically, the effects.

Robin Palmer: Well, yes. From our interim results, as I said, we acted independently as far as this is concerned. And as I said, the we haven't published them yet, so obviously we cannot comment in detail, but the results of the students were very, very good. Excellent. The results that we had with the prisoners were not that good, still positive but not nearly as good as students' results, but we have identified a whole lot of factors which, which could have influenced that.

Because let me give you an example. In terms of research design, we did 10 blocks with the students. And in terms of research design we did 16 blocks for the prisoners in our repetitions of the tests. In real life, if you have a subject, you may carry on to 25 to 30 blocks before you average, depending on the difficulty of the concentration span and the other factors, the artifacts that may affect the results. We didn't have the luxury of doing that, so we're stuck to our 16 blocks and our results are based on what we got in those 16 blocks. So the question just is, based on those two sets of experiments, are we satisfied that the results are good enough to justify proceeding to the next stage? And that's the decision we have to make after we've done that. And at this stage, I think the results are suggesting that this is really worth pursuing.

Dr. Shen: I wonder if we could move here in our last, kind of, parts of the conversation to sort of where you think the future might be. You wrote this paper, which sort of sketched an outline, again contingent on, as you say, further testing of the technology, careful attention to its application. It's interesting you, it's almost, the analogy of given is something like a crime lab that the police, you know there's much evidence that they don't process. They push it out to somewhere else and then they evaluate the results. It sounds like that's what you're suggesting. But let's assume that, just for the moment, that, you know, the testing advances to a place where you are comfortable potentially using it, that you put in place the sorts of mechanisms to address these ethical and legal concerns. What sorts of cases and scenarios and sort of real-world justice questions do you think this technology might apply to? And, you know, it's really interesting for our audience who doesn't know, you should check out Professor Palmer's website me not only has he done all of these courtroom trials, he's also had some of the largest anticorruption and

anti-human-trafficking and organ trafficking cases. I mean, you've really, you've been in the mix. So it's not just theoretical. I'm wondering where you think this technology might some day fit into the criminal justice system.

Robin Palmer: Okay. Look, as a preamble to your ultimate question, I mean of all the forensic brainwave analysis, FBA, which I prefer to call it as an umbrella term for all the systems, not like the nicknames of brain fingerprinting, because it's actually a misnomer, it does no brain fingerprinting at all. Whether it's the BEOS system or the Rosenfeld CTP system which my colleague Michael Finichelli did his PhD on or the Farwell system which we are looking at, looking at the reliability and accuracy of. The danger is that this technology will just become another polygraph in the hands of the police which will be used for litigation and misused to try and get confessions. And that's my real fear. That if we just train police, or law enforcement officials, who don't have the expertise, or the, or in some cases, the motivation, to make sure that it exonerates those that are not guilty but merely use it as an investigative tool, it'll become another polygraph. And then we are back to square one again, because it will lose all credibility in the hands of law enforcement. So, as you said, I do strongly believe that it should be independent testers, properly certified, regularly assessed for their competence, that apply these tests. That's the first point. The second point, the kinds of cases which we are looking at doing at a police station lab would, first of all, start with informers. Informers are an interesting subcategory of people because the police always have a dilemma to decide whether they actually know something they're talking about or they are just trying to make some money on the side. It's a bit like being a double agent in the CIA. So the one thing that police here were very interested in is they waste a lot of money on informers who turn out to be of no use to them. So if somebody says, "Look, I know exactly how this whole syndicate works and I can be the old Mr. Inside, and what have you." You could run a test on them because the probes, those are the clue. Those are the information only the insider would know. Who's the best the big, what's the procedure where are they based on, what ports to the ducks come in on, that kind of stuff. You could quickly weed out anybody who doesn't really know what they are talking about and are just trying to get money out of the crown or the state as it's called here. So the informers would be one way to start because you also have people are motivated to do the test and to pass it. It's not people who are suspects who may try and defeat the test so that's, I think where we will be starting looking at. The next stage would be looking at suspects in probably low-level crimes who do it voluntarily because they want to exonerate themselves. So let's say you, typical scenario which police were looking at. You raid a house, you find a cache of cocaine, 30 people in the house, or 20, or 15, and you don't know who actually owns it, because everyone denies it. So you could run all 15 or 20 through the test and then maybe narrow down the list of suspects to two or three, and with proper controls and ethical controls it's that kind of scenario we want to start looking at. The third stage, which is much more ambitious, New Zealand has at least ten very, very controversial, disputed, criminal convictions. Where are 50% of population believes somebody did it, another 50% believes he did not. They are very notorious here, David Wayne, Scott Watson, famous murder cases where there's a massive divided public opinion. Now, one could, without any proper safeguards, asked that people who are denying their innocence, denying their guilt, sorry, to do a test without any strings attached, where you don't disclose it, to try, and as a first step, see whether, in fact, there is some weight to be given to their protestations of innocence, but that's in the long term and very controversial because that's got the danger, as with the Avery case in the states, of being sensationalized and next thing you have a Netflix

special before the stuff is properly verified. So, having said that, is one further point I want to make. It's unfortunate that, in researching this technology of Farwell's, it became apparent is a lot of professional animosity between the different groups in the field. So, Farwell, and Rosenfeld, well mainly one or two groups, mainly, and a lot of the writing tends to be, you know, one group attacking another group's technology type of thing. So we tried to step aside from all that and tried to do it completely independently because we're not cheerleaders for anybody. We tried to see, does it work. And of course if it works for one technology it should work for the others because they're all based on the P 300 brainwave, and so whether you're measuring amplitude as Rosenfeld does or you're measuring convergence of probes and targets as Farwell does, it should all work if properly applied. So I think the potential is great, but the potential to undermine it if it's wrongly applied or just handed to the police as another tool, I think, there is also a danger in that.

Dr. Shen: Well said. And I think that's an excellent way to close our conversation. Let me just ask, in the end, for those who have heard this and want to learn more about your work and the work that your group is doing, where should they find you on the web?

Professor Palmer: We haven't, we haven't set up a website for this yet, because we want to get the final. We are busy analyzing the results, and of course, each subject is analyzed individually. So there's a whole debate about where do you put the parameters. Why was that? Where did you get that result? So, the four psychology students and myself are discussing with the scientific team in the psychology department here, and Richard Jones. Once that's published as a research report and sent for publication, we will probably be in a position to put on the web what our results are. But as you well know, there's an extreme danger, putting interim results out there.

Professor Palmer: And people with a superficial knowledge of what we've been doing or with an axe to grind against one or two of the people behind the technology may suddenly shoot from the hip and distract our focus. So it will all come out eventually, but they're welcome to email me directly if they want further information on what we are up to and I can give information to the extent that I am permitted to by the team. But as I said, we are very encouraged that there is potential here. But as you well point out the big danger, even once the accuracy and reliability is confirmed, the big danger is going to be ethics and the legal implications of what we do.

Dr. Shen: I'm glad you're proceeding cautiously and carefully. Thank you, Professor Robin Palmer, for joining us today from your home at the University of Canterbury, where they and his team are working on forensic brainwave analysis projects. We will stay tuned and look forward to seeing the project develop, and if you like this conversation, want to hear more come watch and come participate in our panel at the International Neuroethics Society meeting coming up here, October 23rd. Thanks so much, Professor Palmer.