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## Episode 2 – The VICTVS Podcast Transcript

### How smart is taking 'smart drugs'?

**CC**

Hi, and welcome to today's episode of The VICTVS podcast, the place where we meet with friends and colleagues, as well as experts from a wide range of fields to discuss important topics that affect us all as members of the connected global workforce.

So, have you ever worried about the outcome of an exam you're taking? Have you ever considered taking illegal drugs to help you with that exam performance? What about prescription drugs? Or how about a herbal supplement? Or how about just a cup of coffee?

With 10 to 15% of the UK student population estimated to have tried enhancing their cognitive abilities with one of these substances, we're here today with today's guest to discuss the complicated world of nootropics or cognitive enhancers. Dr. Eleanor Dommert is a Reader of Neuroscience at King's College London, as well as being the Deputy Director for Undergraduate Psychology. She has published work across the fields of neuroscience, education and technology amongst others, and joins us today to discuss her research into cognitive enhancers within the UK university student population. So welcome, Ellie. Thanks for joining us.

**ED**

Thank you for having me.

**CC**

So just to clarify, for the people that don't know what exactly is a Reader?

**ED**

That's a good question. It makes it sound like all I do is read, which would be lovely. But unfortunately, that's not it. It's just an academic position, just between senior lecturer and a professor, quite a lot of the universities have now moved away from that terminology, but King's still has it.

**CC**

What was it first attracted you into neuroscience?

**ED**

Well, I actually started off studying Psychology at university and in one of my very early lectures in the first year, I was lectured by a neuroscience professor who asked a very provocative question, which was whether you would consider as a female whether you'd consider getting pregnant, to have an abortion in order to use the foetal stem cells to save your father's life with Parkinson's disease.

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**CC**

Oh, wow.

**ED**

That was a very provocative question. And that was it pretty much after that, 20 years later, still interested in working in neuroscience.

**CC**

Still contemplating that question?

**ED**

Yeah.

**CC**

So, we're here today to talk about nootropics? Or what sort of the term cognitive enhancers? What are they? And are those two terms interchangeable? Or, you know, or is there a difference,

**ED**

They do tend to be used interchangeably with 'smart drugs', as well as the kind of third alternative. There're actually a few different definitions of them. So, you gave a list of examples of drugs at the start. So, it could be illegal drugs, prescription drugs, or even caffeine or taurine, which goes we find in all the energy drinks. So, they could be included in a very broad definition of cognitive enhancers. Most of the time in research, when we talk about them, what we're talking about is use of prescription drugs without a prescription. So, when somebody who doesn't have an identified medical need to adjust their cognition takes a drug that is capable of doing that. So that's drugs like amphetamine or methylphenidate, which is better known as Ritalin, and modafinil. And those three drugs are prescribed for medical conditions. So, we have ADHD, narcolepsy, but when they're used as cognitive enhancers, or smart drugs, they're being used by people that don't have those conditions, to try and reap some cognitive benefits.

**CC**

What kind of benefits do users reportedly see or actually see?

**ED**

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Yeah, so that's a really interesting question, because actually, there's hardly any decent research out there objectively looking at the effects of these drugs in healthy people. We know what their effects are in the clinical populations, the drugs were intended to be used in. So, for example, people with ADHD, but anecdotally people report better focus, and being able to combat tiredness, and so to concentrate for longer periods of time than they might otherwise be able to do. So, most of the terms that people use, they talk about focus, they talk about concentration, they talk about attention. Of course, they're actually all the same thing. When you get past the variation in wording. It's all about allowing people to sustain their attention for longer. But as I said, at this stage, it's largely anecdotal evidence, but that's the kind of thing that people report.

**CC**

And without going into too much of the scientific side, how do we generally work? What's the kind of mechanisms?

**ED**

So, it does vary by the different drugs. So, the ones we know the most about in terms of the mechanisms in the brain are the psychostimulant drugs, amphetamine and methylphenidate. And we know quite a lot about those because of a long history in medicine. And of course, amphetamine is a recreational drug. And they work by increasing the amount of an available chemical within the brain called dopamine and, to a lesser extent, a chemical called noradrenaline. And both of those are involved in our attention circuits and our motivation circuits within the brain. So, by increasing the amount of those, we might expect to see an increase in goal directed behaviour, so trying to achieve a particular thing you've set yourself, whether that's writing an essay or going to the supermarket, whatever it is, it's a goal directed behaviour and to try and improve attention. The most commonly used drug that we found in our research, which has been based obviously in the UK and drug provinces will vary by location because of availability, is actually modafinil. Now modafinil has been used as a prescribed drug for narcolepsy, the sleeping disorder and its mechanisms are very, very complicated in the brain. So, there's no single brain chemical that modafinil seems to act on, it acts on a range of different chemicals. So, we don't fully understand how it works for that one.

**CC**

So you'll see you mentioned your research there, so let's talk a little bit more about that. What kind of studies have you been doing around modafinil and other cognitive enhancers?

**ED**

So the main work that we've been doing is to try and understand what factors predict whether students in particular will take these drugs, there's all sorts of complications in that kind of research, because you can't just go up and ask somebody go into the back of the seminar class or their practical and say, could you put your hands up if you're taking drugs? Because understandably, people would not be willing to do that. So we do a lot of work with anonymous surveys, where students can answer questions without sharing any identifiable information. And in doing that, we've looked at the factors that predict attitudes towards smart drugs. And we know that if somebody has a positive attitude, they are more likely to translate that into an actual behaviour of taking the drugs, we've established that the attitudes will predict their behaviours. And then we've started to look at what factors predict attitude. And we've looked at things like what they believe intelligence is, so there are different views of

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intelligence, whether it's something you have a fixed amount of, or whether it's something you can grow. So we've looked at that we've looked at morality views, because there are some very strongly held ideas that have already come out of research literature about whether it's fair to take these drugs. So we've looked at morality, we've looked at the approach that students take to learning. So if they study in a particular way, are they more or less likely to take the drugs, and probably the most extensive thing we've looked at is, is safety. So safety, of course, is a big deal in taking anything whether it's a drug or a particular dietary supplement, people like to know if they're ingesting something that it's safe. So we've looked at safety beliefs as well and how they impact on attitudes to smart drugs.

**CC**

Earlier on I mentioned the statistic that about 10 or 15% of UK student population have said they've used some sort of substance for enhancing their cognitive abilities. Is that reflected in the research that you've done? Or is it higher or lower than that?

**ED**

Yeah, so our research would say, somewhere between 15 and 20%. And that's for selective use of drugs. So not including things like caffeine, I think if you include caffeine or taurine, the drugs typically available in your drinks that you can buy at Tesco's, or somewhere that will be a much higher proportion. So we found 15 to 20%, when we were just looking at the psychostimulant drugs, modafinil and beta blockers, which are quite common ones. We named five of the most common and that was a proportion we got. But it is worth noting that the percentages or the prevalence of people taking the drug is known already to vary by institution. So research from America shows that the more competitive the institutions are, the more selective The greater the proportion of people that will take smart drugs.

**CC**

Okay, and this is this sort of link back to your research in terms of what factors influence what their decision is to take the drug. You said about how people learn effects whether they choose to or not take the drug. Tell me more about that.

**ED**

Yeah, so we have looked at a range of factors and the learning factor. Interestingly, we didn't find any effects on their beliefs of intelligence. So when somebody believed they had a fixed amount or not, didn't affect what they take smart drugs. But we did find that if they had a tendency to be what's referred to as a surface learner, that they were a bit more likely to take smart drugs because they had a more positive attitude towards them. So this is the person that says, Well, I'll just do enough to pass, I don't need to understand it all. I just need to give an answer. That's enough to get my 40%. So we did find that individuals that exhibited those kind of learning approaches were more likely to have a positive attitude. And we also found that people who, when you ask them to fill out surveys around competitiveness, people that came out as very competitive, also more likely to take smart drugs. So it isn't just about the institution being selective, it could be about an individual's competitiveness as well, although, arguably competitive individuals might decide to apply for more selective University.

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CC

Would you say that students were using them specifically around sort of assessments and examinations where there are opportunities to be competitive, do you think?

ED

In our research, it's very difficult to map things to particular assessment periods because students have assessment all through the year, but obviously, there are central exam periods. But we asked them to give us the reasons they took the drugs, and to rank some reasons that we'd suggested. And the most popular one was actually the other category, the one we didn't give them. And they talked about things like reducing stress and combating time tiredness, which you would probably expect to be greater during key assessment period, like exam periods. Sure. Okay. But they also talked about it being helpful to support learning. So that could happen at any time of the year.

CC

There, obviously a lot of kind of ethical considerations around the taking of these drugs as well. And typically, in regards to academic integrity, and I know your research has touched on that in terms of whether, you know, do people see using these drugs as cheating the system, what your thoughts on that?

So unfairness, or a perception that it's unfair is one of the biggest factors in predicting a person having a negative belief of the drug, which is going to make them less likely to use it. And there's a lot of research still to be done in that area. So we know there are issues around the ethical practice, we know that people who think it's unfair are less likely to do it. But at the moment, we haven't really as a sector, so universities as a whole education, hasn't really worked out how to deal with this issue, it's very difficult to put it into any kind of policy, especially as these drugs are on the whole drugs that somebody could be prescribed for a specific condition. So it's not like you could sort of say to people, well, if you have a diagnosed condition, go through that door to your exam hall, and we won't drugs test you. But if you if you don't have a condition, go through that door, and will drugs test you. So it's a bit it's a bit of a complicated and muddy area. But certainly, it does appear to be perceived as something that is unfair. So we would, at some point, want to think about whether it should be fitting into our policies around cheating, that at the moment tend to focus on buying your essays online or copying your essay from a friend,

You raise an interesting point there. Are there policies? And I know in my research for this episode, I looked to several awarding organizations and universities and you know, there aren't many published policies, especially around the use of study drugs. Is that your experience too?

ED

Yeah, I actually looked again, recently and couldn't find anything that was specific enough for it to be implemented. I guess people sort of mentioned it and say that it shouldn't be there shouldn't be used. There's no policies, it's not anywhere near on par with the, for example, the software tools that allow us to check an essay for matching to the

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internet, which, you know, we have great ways of detecting potential academic conduct issues there. And smart drugs just don't register on that level in policy.

**CC**

Of course, and obviously, the world circumstances over the last 18 months have changed the way that assessments and learning happens in general, do you think that has an impact on the you know, people using study drugs or modafinil or, you know, other examples, where your thoughts around that?

**ED**

I imagine it could have had an impact in several ways. I mean, the obvious one is that while you're in lockdown, it's pretty difficult to get out and about and buy things. So it could have made it harder for people to buy their drugs. You know, in many cases, these drugs are being bought over the internet anyway, so that wouldn't necessarily have impacted on actual access to them. But of course, the situation that people found themselves in, you know, we know that students tell us that they take these drugs to combat stress. COVID has brought with it an immense amount of stress for students as they've had to change how they have studied and in some cases have studied in isolation, either, because they are actually having to isolate because of the pandemic, or just because they are stuck on their own in a house without anyone around them. So it's not quite the same sort of isolation, but they've studied alone. And that could be very stressful for some students. On the other hand, we've seen universities diversify their assessment. So instead of having to go at the end of your degree, and spend three hours proving everything you know, to get the grade, that's going to determine whether you get on the Masters, or the graduate employment scheme you wanted. We're now seeing universities give 24 hour open book exams, or coursework or other kinds of things that could actually reduce stress, there was assessment changes, we may see a change in how much people want to take smart drugs because they just may not see the need with different types of assessment.

**CC**

Yeah, okay. That's a great point. So your most recent publication very much focuses on student attitudes towards safety. In my research for this episode, I could see there were no reported deaths from modafinil that I could find in terms of media, but there is a lot of anecdotal evidence about people having bad experiences and side effects. What kind of side effects can these drugs cause?

**ED**

I think it's important to say that all drugs, of course, can cause side effects. And we've learned that a lot in the last sort of year and a half, really looking at considerations around vaccines and treatments, and they can all cause side effects. The effects that modafinil can have vary from relatively mild sort of side effects that you might expect, so upset stomach, or feeling a bit nauseous, to more severe side effects, which, you know, you don't see as you said, you don't see reports of death from modafinil. And that's just simply because these drugs, or the doses that people will take either as a prescribed medication or as a smart drug aren't going to be particularly high. It is a safe drug in the sense that it's been deemed appropriate for prescribing. So I think you've got a range of side effects, as is from the very mild to slightly more severe. And the key thing, of course, is not necessarily just the mildness or the severity, but the frequency with which they occur. Because, you know, something like diarrhoea is a mild side effect. If it were to continue for a long period of time, it could actually create some quite difficult medical complications if

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you've lost a lot of fluids. But some of the more severe ones, like mood changes, and high blood pressure, if untreated, could again be very challenging, but the fact that they can be treated, or at least if you're seeing a doctor, and that's one of the big issues around smart drugs, they would be able to advise you appropriately and potentially change medication. Of course the key issue is that when you're buying a drug on the internet, you're not necessarily getting our patient information leaflet and you're not getting supervision from a medical practitioner.

CC

Yeah, I read an article recently about a student from London University who sourced their drugs from India and exactly as you said it says modafinil on the packet, but there's no way of ensuring that that's exactly what you're getting inside. And I think in this case, ended up being laced with something called PMA, which is an MDMA substitute, Like you said, lots of dangers around buying drugs off the internet, buying drugs off you don't know, using drugs for off prescription uses that kind of thing.

In your research. What was the student approach to safety? What differences did you see between the different kind of users versus non users?

Well, actually, interestingly, there were pretty much no differences and yet users felt the drugs were safer. So we focused that particular study on safety around modafinil, because that was the most commonly used one in our previous work. And what we wanted to look at was a couple of things. We wanted to look at where people sourced their safety information, you know, are they using social media? Are they going online? And looking at the nice guidelines? Are they using medical journals? Asking their friend what kind of things? So we asked them what sources they were using and then we did a quiz effectively on the known side effects of modafinil and asked people to comment if they were true or false, and estimate the prevalence of the side effects or how common they were. We found that non users and users had no difference in the sources, they were consulting both the number of sources and what sources they were using. Most typically, we're not using, which I think surprised us, but I would consider a positive thing, they weren't using social media as a source of information. They seem to be using sources they perceived as more reliable. And I would probably agree with most of their ratings on reliability. So they were we asked them to rate the reliability of the sources they used as well. So users and non users don't use different sources of information, they don't use a different number of sources. So they will all typically looking at more than one source of information, which is good. So they couldn't be accidentally misled by one incorrect source. But when you ask them, the questions about side effects, the knowledge of side effects of the drug was pretty poor, for everybody. So it doesn't seem that users have some extra insight over non users that can prove the drug is safe, or the flipside of that, that non users have extra insight that it's very unsafe, although safety beliefs, separate the two groups, that doesn't seem to be any basis for those different beliefs in actual safety knowledge.

Okay, that's interesting. So you're kind of in quite an interesting perspective, because obviously, your a researcher the looks into use within the student population, but you are also, you know, a deputy director for undergraduate Psychology at King's College London. So you're kind of seeing this from, you know, both sides of the coin in terms of researcher and also, you know, someone that works day to day with students Is it something mostly that you are aware of in the student population, not just at King's College London, but you know, in the wider university population?

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**ED**

I think, in the sense that our research has obviously been done, so some of it has extended beyond King's, but most of its been within King's, and the fact that we can report students taking it. Yeah, absolutely. We know it's happening. I've not had any students discuss issues around it with me because obviously part of what you do as an academic, as you might be a personal tutor, and so offer pastoral support to students. But I think there's a much wider question around why students find themselves in a position where they would consider taking drugs to support their performance. You know, King's is fortunate, we get very high calibre of students. These are some of the best students that we could find to study the discipline. And it's a worry if they think they're only good enough if they take drugs to support their study. And so I think we need to look more broadly. So education needs to look more broadly at how students can be given the opportunity to shine rather than tested until they drop. Yeah. which I don't think is just higher education. I think it's all the way through but yeah, we definitely need to look at students as a whole beings and think about their lives and their studies and how we can make sure that they get the opportunity to shine without having to rely on something else should they choose to or not is a personal choice, to some extent, when universities can't implement policies around it. But it would be nice that we don't put them in a position where they would think they need to do that.

**CC**

I agree. And, obviously, we're talking about your research focuses on the student population. But I imagine this problem or this thing is more widespread than that. Do you really know much about that? There's so much research in use outside of universities, for example.

**ED**

So there's not a huge amount outside of universities, but there is some research outside of the student population in universities.

**CC**

Okay, interesting.

**ED**

Yeah, this raises an interesting issue around, can we put a policy saying to students, you can't take these drugs, if there is evidence that staff members are also taking them. So some work done by Barbara Sahakian and colleagues based at Cambridge some time ago, again, using sort of survey responses to allow people to reply, as honestly as possible, did find that faculty, so people in academic positions, were taking these drugs, and there were a variety of reasons, just as there were four students. So some were taking them for sort of semi legitimate reasons like jet lag, because they were having to travel around a lot. And others were taking them to boost their productivity, because they just felt they couldn't get everything done within sort of standard working hours, or an extension of that, even within that they couldn't get everything done. So we know that professionals are taking these drugs as well.



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Interestingly, some research done just last or published just last year, looked at professional people's attitudes to students taking them. So this was effectively like the employers attitudes, if you like the kind of overriding results of that were that they didn't think it was fair, and they didn't think it was ethical, which would suggest that within those professions, the overriding view was that it's not fair to take the drugs, you'd expect those professionals to abide by that. But of course, just because that's the overriding view doesn't mean it's the view of everybody.

**CC**

Yes. And I'm sure some employees wouldn't be quite as ethical as that and just want to get the most out of their, their employees, regardless of whether they're enhancing ability to work 12 hours or 18 hours.

**ED**

Yeah, exactly. And of course, wherever there is competition in the workplace, no competition for a promotion, or something like that, you can see how some employees might think, okay, I would consider taking these drugs, even though ordinarily, I don't think it's fair. So the reason the student population has got so much attention is because of the nature of these that these are people that are studying, and these drugs are meant to sort of enhance your ability to do that. But there is some evidence, it's happening more widely, I guess, when it's happening in the workplace, if there's less. It's very rare in a workplace setting that you have an exam, for example, or you have to hand in an essay. But of course, you do have to give presentations and reports and run projects. So you could argue there are similarities, but I suspect that there's so much team working in most employment, places that an individual taking a cognitive enhancer might not make as much difference as a student would perceive they could make to their own performance at university.

**CC**

I think I know the answer to this already, but I'm guessing is generally would you say this is a well researched field? Is it something that's in its infancy in terms of research? What are the next stages? What would you and you'd like to see other researchers kind of looking into around cognitive enhancers?

**ED**

Yeah, I think it's relatively in its infancy. We know, you know, the research has shown very consistently the amount of people taking these drugs, the prevalence, we've identified some factors that might make it a bit more likely. But because of the nature of the questions, you're asking people, it's very difficult to get depth of information, because you're nearly always in a situation where you're having to ask people to give you information anonymously. I'd like to see the research move to qualitative where we could interview people who are taking smart drugs, or who are not taking them or look at some of the decision making processes that they go through. What would be really interesting is to look at how the smart drug use or just positive attitudes towards them, is affected by changes in assessment policy, and changes in university policy. I think all of that would be very interesting. These are almost impossible experiments to design because you couldn't change the assessment for half of your class and know that, that half we're going to take drugs beforehand. And now it's almost impossible. But I think it's important that we start asking those questions or getting closer to them with some qualitative research where we can actually talk to the individuals.

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**CC**

Yeah, and as you said, allow that to then go on to inform actual actionable policies for both academic institutions and beyond, I guess, because something we've both seen anecdotally is that there is not much of that around.

**ED**

Absolutely it needs to be. And I think a lot of that policy won't actually need to be around smart drugs. I imagine a lot of it will be around looking at how we can give a student workload that is manageable, give an assessment structure that is diverse and doesn't put quite such a strain on students. And then I suspect the whole experience might become more enjoyable. And you will never wipe out use of cognitive enhancers if they're available, but I imagine it would reduce it considerably. So the policies may actually be around assessment and workload rather than academic conduct cheating and drugs.

**CC**

Yeah, definitely. Because, you know, once they've made a policy for one thing, students will always find another way to cheat the system as it were. So based on what you've heard today, would you consider using cognitive enhancers to boost your performance? Maybe next time you have an exam or a big deadline at work? Is this breaking the rules? Or is it just using everything available to you? Is it cheating?

We'd love to hear your thoughts, comments and questions on today's topic. So please find us on social media or leave us a comment wherever you're listening to the podcast.

Once again, thank you to our guest today, Dr. Ellie Dommett from King's College London, and if you enjoyed today's episode, please consider leaving us a review and subscribing to make sure you don't miss out on the next episode of The VICTVS Podcast.