Researcher in Focus podcast, June 2023, with Dr Eduardo Coutinho, a Senior Lecturer at the Department of Music.

# Transcript

NJ

Welcome everybody to this month's Researcher in Focus podcast from the Humanities Social Sciences here at the University of Liverpool. I’m Nick Jones, part of the research and impact team here at the Faculty. And today I'm joined by Doctor Eduardo Coutinho, Senior Lecturer at the Department of Music. Today Eduardo will be taking us through his research into how music can help to regulate people's physical and cognitive states in everyday life. So first of all, thank you very much for joining us, Eduardo. It's great to have you here. I wonder if just by the way the quick introduction you could give us a quick outline of your academic background and career so far before joining the University of Liverpool.

EC

Well, thank you, Nick, for having me. Actually I have a bit of a transdisciplinary background. That's how I came to do the things that I'm doing today. Most of my research started in the the universe, let's call it of effective sciences, on understanding more about emotions, about moods, about affecting generally in relation to how our emotions come about, what they mean, what they are, but also how people experience them. And now how they recognise that in people. Very early on I started working in this context, also in the in the world of music. That's what brought me to music psychology, which is the the main area that I do. Nowadays, but paired with all this and that probably will become evident also as we go along, I also had a parallel, let's say, career in machine learning and AI, which I often actually combine with the work that I also do here, as probably we'll be talking about a bit later as well.

NJ

OK, so a varied background there.

EC

Very varied, definitely I. Ended up here in Liverpool. I forgot that part around. 2010 I moved here actually for different reasons than my career, I actually moved here with my wife. She started working here. I was still working in other places. I've been working in Germany, Switzerland, in London and then maintained a part time position here. I think from 2005, at some point I became full time when we stabilised. Here, and I've been, it has been like that ever since.

NJ

Well, that's a good enough reason as any to move to Liverpool with your partner, so we're glad you did. Now your early research, you stay focused on emotional expression, perception through music. And the link between music structure and emotion. Now it seems to me that music is one of, if not the most emotionally affective art forms. This must have been quite broad area of study. Could you tell us a little bit more about what you looked at and in particular?

EC

It it has become a very broad area indeed, I think most intensively the research that probably 20 years ago, which is probably coincided more or less when I also started working in this area and the recognition that eventually music is actually a very strong means to convey emotion, now that's something that we know that people acknowledge that we use music in those ways. One of the things that always interested me so more generally in terms of work we've been looking at while listening experience, setting emotions. If these emotions are actually like any other emotions that we experience in everyday life in terms of their qualities, but also how they feel. Which very much we've been working along those lines that we experienced what we would call real emotions. Naturally they might be different from the types of the flavours of emotions that we have in different circumstances, but definitely emotions in themselves. One of the things that always interest me since the beginning here was observing that actually, you know, many people can react in the same ways to certain types of music, right? So when you think about that, you start thinking about what is there in common and essentially what you have in common to to all these reactions is actually what people are listening to it now and when we start looking that actually people from very different cultures even without any knowledge about the music they're listening to, might react in similar ways. You start looking at what we call the properties of the music itself, the music structure or music is created in the changes and which parameters might be related to its emotional expression, and eventually, what might people perceive, and eventually even feel?

NJ

So is that things like you know, something's done in a minor key. It might be seen as being slightly more, you know, downbeat or or or flat maybe compared to the more upbeat and up-tempo things you might hear?

EC

Well, music is already a much more, let's say, cultural determined parameter. So the most at the most basic level, the things that we are talking to and actually the most robust patterns, patterns relate to things like loudness, like tempo like timber, like actually even some variables that if I start naming them that they probably are not so musical in the ways that we talk about them acoustically like things like spectral flux. Which is the amount of energy in different frequency bands that now they change over time. So different patterns that actually reflect and describe the sound you notice. They carry emotional meaning, emotional meaning that is not only related to music, right. So if you think for example about a person speaking, speaking in a language that you don't understand. And you actually might tell how they feel, just listening to them. You can tell if he's angry, if they are happy, if they're excited, and it’s exactly the same principle. Actually, for several years my research was exactly focusing on this. I'm trying to understand what were the commonalities between emotional expression and speech and music and which were those, the acoustic parameters or these variables that were in common in both domains, but also which ones were different, so to go back initially to your comments on minor major modes. That's actually, which happens in our cultures. In Western cultures, but it's kind of a more of a coincidence due to the fact that we tend to use more minor scales when with sad songs and more major scales with happy songs. When we look at it more globally, we usually don't find those relationships, there are many examples that show the opposite, actually. let me say negative emotion. Let's put it that way. And and vice versa.

NJ

OK. OK. And would you say that music is perhaps the most emotionally provoking art form? I mean, my background is in the visual arts and Fine Arts, paintings and things like that. And although I have quite an emotional response to a piece of artwork that that speaks to me, I'm not sure it provokes it, can't quite so easily impact my mood, as perhaps music can.

EC

I mean, I wouldn't think well as a researcher visual, even as a person, I wouldn't make that that statement for one reason. I think it depends a lot. I think music can be the way we react to music or music is important to us is different from person to person as well. That's something that we have to acknowledge, I think music, and emotional music is, it's let's say it's very accessible, let's put it that way. So it's something that is very natural reaction. We don't have to be taught the emotions in music. We don't have to be teaching to react to, to music in particular ways. But of course, through musical training, for example, and studying music and composers, we can develop a much deeper emotional understanding of the pieces that we're thinking about I think that eventually the difference between these and other artforms, for example, visual arts, that might be just a barrier of the understanding of certain messages that might be communicated or the the power that different means might have to be able to convey emotional meaning in ways that people can understand basically. But I think there are, you know, theatre and dance, that these are all art forms that are very powerful, emotional communicators usually. In a multimodal way, you know when actually combines, you know, different of these ways of communicating motion. Let's put it that way.

NJ

So you say that music can help regulate and improve people's mood and performance in everyday life, which I think we'll come back to a bit later on. But you also say that sometimes there can be barriers that prevent people from benefiting from these uses in effective and meaningful ways. What kind of that barriers might they be that people might experience?

EC

Well, perhaps the way we’re looking at the particular example berries can have actually can be of different kinds. Recently we have been working on a project in relation to depression. We know that music is very powerful means for regulating emotions. People use it in everyday life. We recognise it as effective. We recognise it as a healthy way of regulating our emotions and we, many of use it naturally. But the truth is that some people actually use music in ways that is not very healthy. In that sense, you know, in the same way that we can in our everyday lives and by in different ways, not like thinking about our problems, we can actually make them worse. We can also make our emotions and our emotional states worse by listening to music that might essentially reinforce those feelings in mood regulation language, this is usually called rumination. Basically, dwelling on negative feelings. There are different ways, actually, of achieving these negative outcomes and we can also do the same with music. So with such nowadays is starting to acknowledge that some people, especially those that are at higher risk of depression that tend to ruminate more on well on negative feelings also tend to listen to music that emphasises those those negative emotions and despite the fact that they might derive pleasure in the moment from listening to it, you can actually have negative consequences, so it's our job as well to alert people to that and eventually help them, you know, in an educational perspective, help them acknowledge that, reflect on that and change certain habits. On the other hand, there is the fact that you know, you can use music in positive ways, but not always. You know exactly how. It's not that we just play some random music and essentially it's helping us. We usually assume that people will have a certain level of knowledge of understanding how they feel, how they, you know, can elevate their mood in specific ways and at the same time being able to to have the, the, the, the mind space and even the capacity to put together certain playlists to help them. So we cannot assume this, especially when people actually suffering from emotional problems or or or living with depression. So sometimes we have to offer them the support they need, the knowledge they need, but also the tools that might be useful for them to let's say, enact that potential power of music to help them to regulate where they feel.

NJ

OK. I mean, yes, that's one of things we were going to look at later on in terms of, you know people with but one of the things about depression is it likes to create a, an atmosphere which is conducive to a bit more depression. It likes to kind of keep itself going in lots of ways. Doesn't you know, people will stay and they'll avoid going out. They'll stop doing the things they enjoy. And they will sometimes create that atmosphere by listening to the sad songs or depressing songs or the songs that are reminiscent of those painful times that they're becoming depressed about.

EC

We don't deal directly with people suffering with depression, actually. Indirectly, we do, because is such is so common nowadays that if we engage in a study on music regulation, unavoidably we are going actually to be interacting with high percentage of people suffering with depression. So we do that indirectly. Also, because we have focus on the general population, not so much in this particular work on clinical populations. But we have done work in which we actually show that some of the strategies that we've been suggesting that might be helpful and of course helping people to implement those strategies through music listening are actually effective and have been helping people in actually reducing depression symptoms over time by adopting those. It's called healthy regulatory strategies for mood elevation.

NJ

What do they look like in? Practice. What are those strategies?

EC

Well, in this particular case, we're actually developing an app. So essentially is giving the people the tools to be able to create their own playlist based on the music that they like and listen to. And that's extremely important in every type of work that we do in relation, well I would say generally in relation to music and the impact of music that people you might have in different domains is always mediated by preferences, no? So if you don't enjoy it. If you don't like it, it's not necessarily will have the effects that you desire. So we offer people the possibility of creating playlists that follow specifically some regulatory ways in the sense of healthy ways of regulating our emotions, which might mean rather than just focusing on negative feelings slowly moving towards more positive emotions or emotional experiences by actually creating playlists that move in those directions. But those playlists are actually created on the basis of music that people listen. This is actually a natural way in which most people regulate their emotions. You know, in a healthy context, we slowly, you know, we is, most people would engage if we are in a low mood, we would engage to with experiences that are actually congruent with that low mood. We don't decide that certainly we want to be happy. And then we go out and party actually, typically that move leads us to engage with the stimuli that actually bear with that mood. But naturally, that also makes us feel better, and and then in this gradual process, you elevate your mood up to the point in which achieve a mood which is considered to be positive. And that's what we try to do with the playlists. Try to support people along that journey. And doing everything they need. So basically the objective of the tools that you can have something with you that helps you to generate those playlists which might make the the the mood regulation process more effective.

NJ

OK, so you don't go straight from, You know a very sad song to a party banger. You have to kind of work your way up through the mood.

EC

Yes, and this is, also, these are also important questions that we have to deal with during the research. Right. So we have to understand what our one thing is the idea and and the basic principle of how it can work. Another thing is to show that it's effective. Another thing is how it works in practice, which is very much also our focus. I mean it could be half an hour or why not one hour of music, right? So these are the types of things that when we address practical problems, the, these issues in context, we also have to understand in fact our next step in this process is not even to assume that actually this is something that people want to do is actually showing us the different possibilities and our different ideas to people and discussing with them strategies which they think will be more helpful for them. So an example would be in this particular case we're generating playlists, but some people might want to be more involved in that process, right? They might want to have created the playlist themselves, right? So. What we do is provide feedback. During the process of play playlist construction. If we and for some other people might just be the conversation and the realisation that actually that during the process of emotional regulation you have to pay attention to the music that you are using. So there are multiple ways and understanding them how they work in practice and what works for each person. Each person will also have their preferences. It's also important to have knowledge during the research.

NJ

OK, fascinating. Thank you. Uh, another of your projects that you've got is your music dot me app, which aims to connect people with the music are from their youth. And why do you think this is important? I know one of the aims of the project is to help people suffer from dementia. Tell us a bit more about that.

EC

Yes, a few years ago it came very popular the the ideas I think now in UK mostly known as playlist for life, the acknowledgement that actually music is actually is a powerful emotional sorry powerful memory trigger. So we have we have many experiences in our lives which are, in which music was also present and and the fact is that when we might listen to some of this music, it might we enact all those all those memories and we did all the expression experiences that comes with it. One of the things that start people started observing is that is extremely effective with people with dementia, or at least some people with dementia whereby they are able to recover memories that were lost to them. And with that, they momentarily, at least they are able to function in ways that were not functioning in, in in normal circumstances. So that has brought a lot of people interested in this in this domain and particularly the understanding how which music might be related to the positive and and and how to biographical memories from their past and creating playlists that might be able to trigger those those memories and therefore reenact positive experiences. So music media appears in that. No, we cannot. Again, we cannot assume that we know that music now and you can in many cases you cannot ask people with the measure what is the music that is actually connected to your past experiences. The families might not know as well right in. In many in many people don't even have their families supporting them. So we have to find ways of, you know, overcoming this barrier essentially and and try to find the music or giving peoples and carers the the, the, the tools that allow them to identify which music might be relevant music means occupying. That space, essentially.

NJ

OK. Yes, I did have a go on it when you sent the links here on your blog I find quite interesting. You can choose to put in, for people who want to go and try it, it's quite an interesting, so if you can put in like when you were born are kind of popular you for music you'd like those or whether you prefer something a bit more kind of off the weird end of the scale maybe. And if you want it up or down. And I tried it a few times and it got quite good hit rate. I mean it did suggest that I might want to listen to Dire Straits as well, which was very wrong. But I think the rest is pretty good. So, it was really an interesting thing to.

EC

No, it's definitely the, it's just a tool that actually allows you to select the tool itself. It even allows you to exclude the music that is not relevant. So ultimately you could, you know, curate your own playlist which eventually and at the time we did this during COVID, the aim was also that it could be played remotely, so the families play the music for for their families in care homes. Their children play that remotely again because you cannot see you. You know, technology is very useful, but you cannot assume that everybody is actually able to use it, right? So that was also it had also that side of. Or that component, let's put it that way.

NJ

Yes, it's so powerful that a piece of music can transport you right back to a certain time. Yeah. Now, on your blog, you also mentioned that you work collaboratively with academic and non-academic partners to help deliver these various changes. You tell us about some of the partnerships you've created to achieve your aims. I mean, I think in particular, about your Applied Music Research Lab.

EC

Yeah. I mean, if you see from the conversation that we have been having, actually we are talking about a lot of different things that not not the music itself, right. So this is transdisciplinary work by definition essentially and that of course in terms of research involves collaborations with academics and fortunately, Liverpool is an excellent place to do this type of research. We've been working with Centre for Cardiovascular Disease who recently started the project also for some applications there with Health Sciences with Psychology, with different departments essentially focusing on specific problems in trying to understand how music could help in different ways. Is one of the examples that I mentioned in blog is in stroke rehabilitation. Actually what we're proposing there is music as a way to mitigate barriers for recovery. So in terms of helping people to improve their mood generally, which is a very common effect, but also to help them physically because music can also reduce pain perception levels, which means that you might be able to engage with therapy for longer, but also different aspects that seem to be important. So we are looking at these things. In terms of understanding how music can help, but also trying to demonstrate in some cases the mechanism, how it helps, if that's evidence doesn't exist. It’s work that is very often done with academics, but in some cases we also focus on problems that institutions might have. So even today I was having a conversation actually related to the previous to music beat to the previous thing we're talking about. So we have meetings with institutions that have specific problems that they help us to solve them now. And you can use music in specific ways actually. How can they understand the way that they are using music in a particular context? We did this with the music therapy company, for example, in which they wanted to develop more objective measures to understand the effects that their therapy, therapy was having on their clients. We worked also with sometimes with the NHS, also with very specific projects. In this particular case, was looking at eating disorders and how music actually and music interventions can help in that context, how we can measure those interventions? Uh, with charities we have been hosting in, in Liverpool for a couple of years, project called Turtle Song. We even have a PhD student working on this, which is again for people with dementia. But developing some writing workshops which again with the same outcomes in combating social exclusion. And bringing people together, but also re-enacting all those memories and experiences that come through. Also when you engage with music more actively, 1st through listening and in that particular context, our PhD student for example is working on making these types of interventions more systematic, which is another barrier to the power of music and using music in everyday life is sometimes you don't really understand how things work or what are the best ways of making them work in practise and for a wider range of people. So sometimes you also do that. So in this case we're developing A toolkit that helps people organising some writing workshops that are as beneficial as possible for people with dementia and their families, which actually it's also very important.

NJ

OK, so taking the work outside of the university and out into the community around us and helping to make a difference there.

EC

And the other way around, also bringing their work to us so that we can also learn from that, because there's there's a lot of examples out there, a lot. I mean of excellent work being done that is important to. We also learn from it not only helps us not only forms our research I think but also opens new opportunities for us to understand things that might work in real in the real world. Let's put it that way.

NJ

OK, you mentioned some of the projects that were being led by some of your students and you also talk about some work that's being done by one of your students, which looks at the impact of listening to music on studying tasks like while you're working or revising or whatever, it's never been the thing for me. I have to have silence when I'm trying to revise music is just distracting too much, but I know a lot of people do it. What has been the findings that have come up from that?

EC

Well, we can start there. Some people do it. Some people don't. OK, that's pretty obvious. Some people actually from the service that we usually do in the literature that we know, we always find that more people actually engage with music. But of course, in specific context, especially young people, right, because young people also have the tendency to listen more to music, and most studies tend to be focused on young people. So we will always have to understand things in that context. But your basis of this research is the fact is that we have to acknowledge that, you know, music engages your brain when you're listening. Right. And well then, if you are seeing or even performing even more, but in the case of listening, it already engages a lot of the brain. So we have to acknowledge that potentially might be interfering with the resources that you need to do other things, especially when you are engaging with the more complex tasks and not like learning a new topic or reading a complex book or trying to write an essay right versus lighter task which is taking notes or planning nature doing more basic things. So that's what we're looking at. So there there's been quite a few research done recently. We did this very, very large systematic review on the topic in which people try to look, how does how does music impact particularly particular cognitive activities or cognitive functions? Which is a very psychological way of looking at the problem. And when we look at all that research, for example, in a nutshell, we find that actually music doesn't seem with the available evidence, of course, and that is important to acknowledge it, in the for the majority of tasks, music doesn't seem to have a positive or negative effect, so not not also positive in the way that things were measured. When it has, it tends to be negative and a lot of the times is related to tasks in which you have to read, and this is even more evident when actually the music has lyrics and this starts to make sense, you know if you're listening to music that has words, you have to be at the same time. You can see the obvious interference in that process. Of course this is justthe overall picture, because many of these studies are, there are very few studies for specific tasks, so we need more evidence to understand this. But what we are doing in this context of putting the problem in a real world context, we've been looking at it in a different way as well, which is to say, you know, actually we don't test individual cognitive capacities when we are doing something, we just sit and study or we sit and work. So let's look at what happens in the long term because one of the key reasons why we do listen to music is because it motivates us. It makes us be in a better mood. Fight the boredom of sitting down for longer periods of time, so there's also very good, good reasons to think that actually music is helping us to study. And that's very good, because if I don't study, that's also a very bad outcome, right. So we've been looking at the interplay between the emotional effects. And the potential negative or positive cognitive consequences of that. And actually what we're finding is quite interesting is that music is allowing your mood to be more stable, not degrading so much overtime and having also another very interesting consequence which is keeping your willingness to engage with connective work for a little bit longer. So it might we can see it as a more of supporting endurance in the engagement of the cognitive tasks. And indirectly or directly actually that leads also to a better performance, so it's not a simple question. It's an interaction between the mood effects that music has, how it affects the way you feel, and how actually that affects your performance and that seems to outplay the potential negative effects that music might have.

NJ

OK, so it's quite nuanced. It's not that music helps you to learn information in but it might help you stay in the chair a bit longer in terms of time.

EC

Exactly, at least for some people. And that's important to note. There are some people that really do not benefit from listening to music at all and and you know, and that comes across and many of these people actually recognise it. And are those that eventually don't even listen to music for those very reasons?

NJ

Yeah, that will be interesting. What you say it depends on the task as well if I'm doing a more creative task, then music's fine, but if I have to sit down and, you know, revise or, you know, an exam. music doesn't help so interesting, but it depends what you're doing.

EC

And the music itself, I mean, depends you, the the big conclusion of all our view is, is about the individual, the task and the and the music that you listen to because some music can be more or less intrusive. And that's also important. An important angle to it.

NJ

Yeah, and now, interestingly, at the top of the our chat you talked about, you had a background in AI and artificial intelligence, and I just wanted to ask you about, obviously AI is growing becoming more prevalent in today's society as as technology moves things like Chat GPT and AI produced images and things like that. Lots of people who are writers or who are artists or whatever, are perhaps slightly dubious about the creation of AI generated images because it's it takes, it takes the creative work out of it and it just you know, kind of stops everything and creates it. What's your view about AI generated music. I've been reading about, you know, Spotify is going to start creating playlists purely from AI. How do you feel about that?

EC

Well, first I have to disclose that I throughout the years already 15 years ago or probably a bit less I was already doing music with AI and algorithms. OK, so, so I have to disclose that. So I have that angle at the time with the simple curiosity and I think that's what triggered a lot of the the projects that go on. People are curious about this. And even recently, we did an AI music concert here at the university, actually mostly focused on the work of another PhD students that he’s focusing on the copyright implications of that because all these models are actually learning to compose music, let's put it in that way by looking at existing music. So, but they're not paying royalties, right? So there's some questions there that have to be looked at. This is that the focus of that work, but in this concept we actually created on on the AI models generated the music and made it happen. But for me it has always been a curiosity. I'm not a musician myself. So it's actually interesting that you can actually make music without with different set of tools. As for the future of it, I think that time will tell us. I think we have to worry about the ethical issues that surround all this, understand the impact it might have in different careers and in society. But I don't think that we can put a break on things. I think as a society, we have to keep an eye and I think that has been happening very fast in the last few months in terms not just in terms of music but other domains. I mean, it's also a big thing in domains of health, for example, in medicine, we also have considering these. But I think it's just it's going to evolve. My position is exactly that, a little bit of keeping our eyes open, discussing it, talking about it and eventually I don't think we can stop things. But I think like many other topics, we have to be aware of their implications and how we respect. Individual freedom in the process, eventually.

NJ

Yes, I mean absolutely right that that box is open now, isn't it in terms of you know these things are out there. So it's just seeing where they go and. What's been the most interesting or impressive or intellectually stimulating thing that you've come across in your research into all of this, that.

EC

You mean apart from a computer generating a music piece or or painting? Yeah, that this bridge is arising actually. Let me think for a second. I think it's actually something that I learned very on very early on and this came in the context of studying emotion and music in the same context. It was the acknowledgement of how deeply rooted music is in human nature and looking at looking at the question of music as an evolutionary question and its origins, I think that has been one of the most powerful things that I learned in this process has not been directly my research, not at all, actually linked to things that I we spoke in the beginning about how music communicates in motion and music. Structure is also related to this big understanding that music might be at the very origins of being human. It seems to me a very powerful lesson to be learned.

NJ

So it's one of our almost primal needs to drives. If you'd like to, to create music.

EC

To create music, to listen to music, to use music in ways that are so powerful they live into. They are useful because when we're talking about the the uses of music, which is a lot of the things that we also do in the lab, we are actually tamping. Into things that are quite intense. So so some of them that have very modern manifestations, but the basic principles and the way that music is interacting with our brains and the bodies is actually related to its very origin and that's something that always really fascinated me. And and I keep reading about it because the very speculative area, as you can imagine, like everything around the evolution, but they are very interesting ideas about that.

NJ

An essential part of who we are by the sounds of it definitely and so from all the things that we talked about and you know your careers, it's about so far, what would you like to see as the most significant change developed out there in the real world as a result of your research.

EC

I think it's probably the same the the same idea that actually brought me to move into the the research that I'm doing since I moved to Liverpool, I think I just want to know the the that people really have, not only the knowledge of how music can improve their lives, but also the capacity to make it happen right. And that happens when we offer them again the tools, the knowledge and and and the ideas. And we make everything available to individuals, to institutions and enacting all that process. I think if at the local level or at any other level, we can enact those changes, I think that's a pretty big achievement.

NJ

Wonderful, music is an enabler for change, yes. Wonderful and, Eduardo, thank you so much. That's been a really wide-ranging, fascinating and interesting talk, thank you so much for joining me.

EC

No, thank you, Nick. Thank you for having me.

NJ

That's been an absolute pleasure and thank you everybody to as well for listening. And next month we'll be very pleased to welcome Professor Larry Barnum from the Department of Archaeology, Classics and Egyptology. I'll see you all then goodbye.