

Conversations In Tinnitus

With Elizabeth Beach, PhD

Transcription:

John Coverstone, AuD: Welcome to *Conversations in Tinnitus*, a podcast of the American Tinnitus Association. The American Tinnitus Association is a non-profit organization dedicated to research, advocacy, education, and support for people who live with tinnitus. *Conversations in Tinnitus* podcast are an extension of ATA's magazine *Tinnitus Today*, the only publication dedicated to educating the public and practitioners about ongoing research, treatments, and management of the condition. [music]

JC: And welcome back to another episode of *Conversations in Tinnitus*. I'm John Coverstone. As always, along with Dr. Dean Flyger. And joining us now is a very special guest, Elizabeth Beach, joining us from the National Acoustics Laboratory in Sidney, Australia. And she is the department head of Behavioral Sciences for NLA and welcome to *Conversations in Tinnitus*.

Elizabeth Beach, PhD: Good morning, John. Thanks for having me.

JC: And thank you once again for being our guest. Now, there are a few things we want to talk about. Those of you who received the *Tinnitus Today* publication from the American Tinnitus Association may have already read some of your work, the interview with you and we have an article in the Summer '19 issue about some of your recent research. So let's start with that and talk about some of the research you've been doing as well as this very intriguing one where you looked at people's preferences and how those related to the noise environments that they're in.

EB: Yeah. That particular study was a nice one to do. It was an internet study, so an online survey where we had the opportunity to ask a lot of people a lot of questions about their attitudes to hearing, and noise, and find out about their noise exposure and what sort of activities and habits they had. And so what we did in that study is we extracted all the people that were regular gig-goers and also nightclubbers. So people who told us that they regularly attended those activities, we decided to ask them some additional questions just to get in a little deeper to find out what they thought of the sound levels at those venues and what they thought-- their peers thought of the sound levels at those venues. And what we found was that, in fact, people don't actually prefer the sound levels that they hear it at nightclubs and at live music gigs. And interestingly, when you ask them what they think other people think about the sound levels at those venues, then we find that people had this perception that other people like it to be loud at those venues. And so there's this really interesting sort of social norm situation going on, I think, where people think that everybody else likes it loud and, therefore, they think they should like it loud and everybody's sort of perception sort of increase slightly to be in line with what they think everyone else is thinking. And so we found ourselves in this situation where nobody's actually asking for sound levels to be lower and nobody's really admitting to it, nobody's really talking about it, and I think that's one of the really strong cultural things that are going on in these sorts of places which is helping to keep sounds levels probably a little bit louder than all of us would like.

JC: And why do you think that is? Have you talked to people and found out if there's a theory behind low sound levels or is it just their preference or their recreational--?

EB: Yeah. Look, I think there's a lot of different things going on and a lot of it is anecdotal. It is very hard to sort of really get at this problem and because it comes from-- there's so many stakeholders involved. So there's the managers at the venues, there's the sound engineers who are controlling things at the deck. There's also the musicians and they have some sort of control over the sounds because they've got their stage monitors and the sound levels that they want to hear. And so when you sort of pull all these things together, there's lots of different ways that the sound level can increase over an evening. So you might talk to managers and they say, "Well, we need to have the noise level up because we don't want to hear the audience talking. We've got to have the sound so that is loud enough to drown that out because, otherwise, it doesn't sound good and it doesn't sound like it's loud

enough to be a good musical experience." There's other people who say, "Well, we need to have the sound level up because we want people to drink more." And there's this perception that if you're finding it hard to have a conversation, then what you do is you resort to just going and getting another drink when it's just too hard to have that conversation with the person in front of you. And so there's some evidence. I don't think it's particularly strong evidence but there is some evidence that the drink sales go up when sound levels are up. And I think just at the time, we've got ourselves to a situation where we associate good times with loud music and it's that sort of-- that connection between the two queues that has sort of intensified and reinforced this social norm that loud music equals a good time.

Dean Flyger, AuD: So when you were presenting these surveys and these questions, did you get the sense that the stakeholders-- so not the participants but the club owners, the board operators, did you get the sense that they felt like they were-- contributing to any kind of hearing damage or was that something that was left out of those surveys?

EB: Yeah. We were really focused on the patrons and the clientele in those surveys but certainly there's work to be done, I think, talking to music venue owners. I've just had a PhD student recently complete some work where she did more of that sort of thing where she went into some live music venues in the city of Melbourne and she introduced some software to these venues and to try and see how the venue operators, how the sound engineers would interact with that software and how they would accept the possibility of trying to moderate the sound levels a little bit. And so she's done a little bit of qualitative work there trying to find out what people think but there's some really interesting things. The last sound engineer I spoke to was talking about this particular software and we were talking about how do you think you'd go introducing a sound level, some sort of limit or some sort of target that you would try not to go over on a particular evening. And I was talking to him about the differences in genres and how maybe for one particular type of band, you might have a slightly higher level and then for maybe some indie or folk pop sort of music, you might tolerate a lower level. And he was aghast that I would suggest that you would have two different levels available for bands. He's like, "No. There's no way that two different bands would accept that they would not be allowed to go to the same level." So he was sort of, I guess, transmitting that attitude that everybody wants the possibility of being as loud as each other and there's this real-- I don't know. This sort of underlined competitive thing about it. I think there's probably that idea of artistic integrity. That if you're trying to limit the sound level or you impose some sort of standard on people, then they feel that their artistic integrity's been compromised in some way and that they're not allowed to express themselves as freely as they would otherwise. And I can see that argument but I don't think it really stacks up when you're considering the potential cost to your hearing and the fact that I think we do have a duty of care to at least limit the sound levels to some extent and to also inform people that going into these environments is a risky thing to do. And if you're doing it regularly, then I think it's-- we're compelled to let people know that there's things that they could do to try and limit their in-person exposure and there are long-term consequences for gigging every other night.

DF: So it's essentially personal responsibility is the message that is probably going to be the most effective, given all the stakeholders, that the best thing to do is educate the club goers to be good to their hearing and take that first preventative step.

EB: Yeah. Yeah. It's always going to be a multifaceted way that we need to approach this. It's not going to be one single solution that solves all the problems. And certainly, that top down, that heavy handed approach is probably-- it's just not going to work, especially with that sort of population. And so while I think there is scope or there is a need to set some sort of overall limit so that levels don't go into this crazy sort of super high risk levels, but I do think, yeah, personal responsibility is a really big part of it. And because venues don't know-- you might be a clubber who goes once a year, once a decade. And so your risk level is inherently lower just because your duration is so much lower. But on the same token, there's people that are really regular goers, they might be attending events. Then if they're super music lovers, the chances are they're listening to their headphones every other day. They might even work in the industry. And so there's people who've got these really big cumulative noise exposures that, as a venue owner, you don't know the differences in your different patrons. And so giving them information and helping people understand that your own noise exposure is something that you can control and that you can limit is, I think, what we need to do here, for sure.

JC: And you have been actively involved in doing some of that already, not just locally, as I'm sure you are, but you are part of the World Health Organization's initiative called *Make Listening Safe* and there are quite a few materials

they have put together, some really nice-looking, well done materials with good information in them. And I would encourage people to go online and do a Google search because the URL for that page is not something that we're going to read over the podcast and really make sense of but if you do a search, rather, for WHO *Make Listening Safe*, it comes up pretty easily. So tell us a little bit about that initiative because that is exactly what you're trying to do with that.

EB: Yeah. Look, that's been a really nice thing to be involved with. So it's a nice collaborative group, international researchers from all different places, Europe and the US and a couple of us from Australia. And it's headed up by Shelly Chadha, who's from the World Health Organization, and she's really passionate about hearing healthy and, in particular, the potential risks associated with recreational noise exposure. And so the initial focus of the group was looking at trying to limit sound levels through audio devices, through headphone listening. And so, as you say, they've developed some really nice-- some messages there and they've been working quite closely with some of the manufacturers. I'm not sure if you're aware but, recently, the new Apple operating system has changed and they've introduced some new features there which are limiting noise exposure. So that's exactly the sort of influence that *Make Listening Safe* is trying to have where not all the responsibilities are on the person. There's this combination where people who can control devices and so on can do that to at least some extent and then it raises awareness for the individual and then they can make some choices. And so recently, the *Make Listening Safe* initiative has started to think about how we could create similar messages in terms of music venues. And so that's where we've become a little bit more involved and we've recently did a big survey looking at various jurisdictions around the world looking at legislation and regulations and rules that are in place to limit sound levels in venues to try and just bring together a collection of what's currently happening out there, is there any evidence that those sorts of limits work. And if we were to try and develop some sort of international guideline, what might that look like.

JC: I'd love to regroup with you at some point in the future if they do that and find out exactly what they found from those surveys. That would be really interesting. Back to the study that you most recently completed, a couple things that caught my eye. One is that I noticed the population in your study was 19 to 99 years old. Is that an Australian thing or--?

EB: 99-year-old clubbers?

JC: Evidently.

EB: Yeah. Well, we were pretty impressed with that age span. Look, I don't know if it's a typo but the survey was a really wide-ranging national survey. So we were lucky enough to team up with the National Broadcaster, the ABC here, and they've got a really wide radio network. And so this survey was advertised around the world. We got coverage in every state, all the major cities all around Australia and got this really nice spread of people. And our definition of music venues was live-- I think it was live music venues where loud music is played. And obviously, loud music is a personal perception. And so, obviously, there were some older people who regularly go to loud music venues. So yeah. They were included in our survey.

JC: And just to mention too, the survey that you did, over 9,900 people, 9,904 people completed the general survey and almost 1,000, 955 were able to be redirected to this specific survey about music listening preferences. And so that's a big number and it lends a lot of credibility to that data, I'm sure.

DF: Yeah. Big sample.

JC: Yeah. There's something you mentioned earlier and it's in this study, I wanted to ask you about this because this seems like a recurrent theme. Of course, Dean and I are not behavioral scientists, you are. But this idea about people's perception of their own habits and preferences and others' habits and preferences seems to be a recurrent theme that we see in various areas of social science.

EB: Yeah. That's right. And it's a really interesting one because often you just ask people directly, "What do you think?" Or you try and find out from their behaviors what do they think. But the power of peer pressure, which we know from when we're kids-- and a lot of the education it's done in schools is all designed to try and counteract that peer pressure that we know is so strong and it's usually associated with younger people. And as you mature, you become more sure of yourself. And we like to think that we're less influenced by our peers but, in fact, I think the influence of social norms and that pressure and that desire to not stand out from the crowd and to be like our

friends and people we like and admire is something that's quite pervasive and it does seem to be there throughout our adulthood not matter how mature we think we are. And so yeah. In quite a few studies, we've now asked that question and we try and separate the questions. So on one page or one screen, we might ask, "What's your perception-- what's the volume level that you like?" And then we put in a few other questions and then we come back to asking people, "Okay. So just give us an estimate. What do you think your friends like or what do you think other people-- what's their preference?" And we've done this with not only the music venue questions but we've done it in an earlier study too when we asked about listening on headphones, "What do you think other people are doing out there?" And you get this really consistent trend where people perceive that other people are listening at loud levels and they like it at loud levels. And therefore, there's this little disconnection because if everybody else is listening loudly but you're not, then it doesn't make sense because there's all these other people who also think that you're listening loudly. And so I think we all push each other up slightly. Back to what I was saying right at the start, I think that it means the sound levels are actually slightly higher than all of us or most of us would like them to be and it does mean that it's very hard for us to exert pressure on sound engineers and venue managers to drop it down because we're scared because we think that everybody else is enjoying it just that little bit more than we are.

JC: Yeah. And I was going to mention that other study, which I believe was lead by Megan Gilliver, who is your co-author in this study.

EB: That's right. Yeah.

JC: Yeah. So that was an important one as well that really ties in closely with this.

EB: Yeah. That's right. And I think that's probably one of the first times we looked at these social norms and, to be honest, we're quite surprised by it. But I think it explains a lot.

JC: Well, and I've noticed that in other things. And so this is why it really struck me. Dean and I can attest, being clinicians, and the reforms we've had in health care in terms of ethics and things such as that. Is just amazing to read the social science literature and see time after time people will rate other people as high as 78% of other people are, say, practicing unethical or doing unethical things. But it's never more than about 20, 30 percent of their own selves that are doing that. So there really is this disconnect between things. But the key question then is is that really important information for us to realize when we go about education and trying to change some of these things that we're discussing?

EB: Yeah. Look, I think one of the things that immediately comes to mind is that idea of trying to use social norms to deliver messaging. So we know that the Big Brother effect is probably going to be a turn-off, if anything. And so finger-pointing or having an authority tell people what to do is probably not going to work. So if we can devise ways that we're sort of trying to transmit our message through peers, then we've probably got a better chance of that message getting through. And I think people try it-- you can see it in some of the hearing health campaigns around various places where celebrities or rock musicians that people admire and like to associate with are used to deliver messages and that's one approach. But I think even just trying to get really authentic messages that come from other people that you associate as your peers could be a way for us to get our message across and for it to stick a little bit more. But it is a fine balance because people are suspicious, I guess, or they're a bit skeptical. So if you've got a nice-looking actor who's pretending to be your peer who's telling you to wear earplugs, then that could also backfire. So it's something that quite hard to do well, I think. But yeah. I think we need to look into that and see if there's ways that we can try and make that an effective way of sending messages.

JC: Sure. Makes sense. Our audience with ATA, our membership especially at American Tinnitus Association, if anyone gets this message, they do. Because you don't realize the importance of minimizing noise exposure more than when you've had damage from that noise exposure. Hearing loss and/or tinnitus, hyperacusis, what have you. And so I would be surprised if many of the people listening to this podcast didn't have on the tip of their tongues right now the question, "Where can I go and get some of these materials so that I can educate people in my community? Who can I partner with?" And I would say your local audiologist would certainly be a good place to start. But are some of those materials on the WHO website or maybe anything you have there at NAL available for this specific message to try to help people to spread that message in their communities?

EB: Yeah. Absolutely. So, we're trying to put a lot of work together in a single website which is called *Hear Smart*. So, it's HEARsmart.org and people can go there and download various flyers and pieces of information which we've tried

to present in a really simple way. We also have a website called *KnowYourNoise*. So, people can google that and find it. And that's a way for individuals to try and go on-- we were talking a little bit earlier about how noise exposure depends on your own frequency of exposure, and how long and how often you're in loud places. And so, Know Your Noise is a way for people to basically plug in their activities and their recreational sorts of habits and then, at the end of that process, the website calculates a risk factor for you. And you can think about how you can change your habits or maybe reduce the amount of clubbing you do or maybe cut back on the number of hours you listen over headphones and then you can see how changing your habits can reduce your risk. So we've tried to do that as a really personalized way of spreading the message. And back to what you said about people with tinnitus and the audience for this podcast being so aware, what we found in one of our-- really one of the first studies I was involved with was just how powerful tinnitus and hearing damage can be. So we did a qualitative study where we talked to people who regularly wear earplugs and hearing protection when they go out clubbing and to loud music venues and one of the really consistent messages we found in that study was that all the people who had realized that it was a good idea to wear earplugs and who was sort of quite passionate about wearing earplugs nearly all of them had either experienced tinnitus themselves or had it permanently or had temporary bouts that was quite scary for them. Or they had friends who were suffering tinnitus themselves or had the effects of hearing damage and they had given a really powerful warning to these people and they have become really strong advocates for wearing earplugs. So, I think that's another example of the sort of social messaging coming from your peers being a really powerful thing. And yeah, I think this community is one of the really important ways that we can get our message across.

JC: Sure. And I often want to interject and so I'll do it here very publicly when we're talking about things like hearing protection in a situation such as music where you want to hear the music and putting a pair of foam earplugs or those good earplugs or earmuffs, they do-- let's admit it. They do distort the music. The music does not sound the same. But people should know that there are other options available, especially if you get something custom from your audiologist. They don't have to cost an arm and a leg. In the US here might be - I don't know - 100, 125 dollars for a pair that can last you for years. And so those options are available to people and they can then preserve the sound quality of the music and allow you to enjoy it as well as protect your ears. And so there are solutions out there and you don't have to compromise.

EB: Absolutely correct. Yeah. As you say, there's the custom earplugs and that you can get from your audiologist. You can get them with different filters, so different levels of attenuation. And yeah, it's true. You don't need an earmuff that's going to cut down the sound of about 20 or 30 dB. That's way too much. That would be overkill. But a pair of filtered earplugs, if you're only going to venues every once in a while, that drops the sound level by 8, maybe 10 or 12 dB, that's plenty. It gets you down to a safer level. And the really interesting thing is once you start using earplugs, you start getting used to that sound, people tend to find that they prefer the sound level because the sound level at venues are so high. There's often a lot of distortion, there's often a lot of feedback because the sound systems are really getting pushed to their limits. And so people find if they do wear filtered earplugs, it just really gets everything to a nice, comfortable listening level and you can actually have a much better experience when you've got them in than not.

JC: Yeah. I agree wholeheartedly. Absolutely. And here in the US, we usually cite the National Institutes of Health and, in this case, the National Institute of Occupational Safety and Health and their noise scale for acceptable length of exposure because, of course, risk of hearing damage comes from not just the level of the noise but from the duration at which you listen to it. Does NAL have some similar recommendations in terms of the noise dosage, as we often call it?

EB: Yeah. Look, we're very much in line with NIOSH. So we use the 85 dB over eight hours as that workplace standard and we use the 3 dB exchange rate. So yeah. Whenever we talk about durations and get down to the technical details, we're very much aligned with that. And our workplace standards use that as well. And so yeah. It helps to keep things very consistent when you're talking about exposure. And that Know Your Noise website I was talking about a little earlier, the formula is behind that role related to the 85 dB over eight hours with the 3 dB exchange rate. Yeah.

JC: Okay. And just to clarify that for our listeners that what that 3 dB exchange rate means is every three decibel increase over 85 means that you need to have cut at one half your listening time. So if something is considered safe for eight hours at 85 decibels, if you go up to 88 decibels, it's now considered safe for four hours. If you go to 91 is

two hours, 94 e one hours, and etc. Until you get up to concert-like levels and sometimes it's 15 minutes or 10 minutes.

EB: Exactly right. Yeah. That's right. 100 dB is 15 minutes in that scenario. So yeah. And that helps us too because we can say to people, "Okay. If your favorite song is about to come out but you really want to listen to a particular part of a concert, then go for it. You've got 15 minutes to find what you want to hear in its purest form. And then the rest of the set might not be so interesting to you or you might be able to compromise a little bit there. So that's when you put in your earplugs or move a bit further back from the speakers and get your exposure down that way."

JC: Have you done any sound level measurements at some of the local nightclubs and also live music venues to see what those levels are?

EB: We have. We have done hundreds of measurements, I would say. Yeah. We've got them all collected in a big noise database. And I think the worst that we have found was quite recent which is sort of disturbing because we've been working in this area for a while but we keep finding these really extreme sound levels. But yeah. We've seen 109. 106 is pretty common. But yeah, 109, a heavy metal band in a late-night venue in Melbourne and just incredibly, incredibly loud. And I struggle to see how anyone can enjoy it, let alone sort of stay there for more than a couple of minutes. So yeah. There's certainly people out there who are damaging their hearing without knowing about it and, yeah, there's some people who really need to hear our message, I think.

JC: Yeah. I assume all the lead singers there think that they're going to be the next successor to Brian Johnson. And so they're trying to--

EB: Yeah. Yeah. I'm not really sure what they're thinking but yeah. Yeah. There's some really powerful systems out there and some people are really trying to crank them to the limit.

JC: Yeah.

DF: Well, it gets back to the social science. I suppose they feel everybody else really likes that pain and distortion, so they're going to stay there too.

EB: Exactly. Yeah. Yeah. And it's that real-- yeah. That real desire to give people what you think that they want. And yeah, it's really interesting. We're all just thinking what we think but no one's necessarily calling it out and talking about it explicitly. And I think if we did that a little bit more often, we'd all be comfortable with some slightly more comfortable listening levels.

JC: Well, and you've certainly given us some material to use to do that. We can literally go out with confidence and say, "Your peers do not like these levels either. You're not alone. You're not the only one that is bothered by these levels and it's okay to acknowledge that, to talk to your friends about it." And it seems to be that communication gap is one of the biggest barriers here. And so if you start talking to your friends and find out, "Oh, they don't really care much for these levels either," and not just assume that everybody else is enjoying and you must be in the minority and you shouldn't say anything, you shouldn't speak up about it, if we can get past that barrier, that might go long ways toward solving some of these problems.

EB: Oh, yeah. I absolutely agree. And that's why we're so glad that you've picked up our research and that you can help us to get our message out there because I think that's going to be the most powerful thing, people talking to each other and coming to that realization that, in fact, we would all like it to be a little bit lower. And maybe in time, we'll create our own social norm where everyone starts to get on the same page and to realize that. So yeah. I totally agree.

JC: Yeah. I was just thinking a few days ago, I will never figure out why it is that everybody knows you shouldn't stare at the sun and, yet, everybody thinks you should go to a nightclub and listen to something at 110 decibels for three or four hours at a time. Why is that so hard?

EB: Yeah. Yeah. I think it's something that behavioral researchers probably contemplate a fair bit. And yeah, I don't think I have the answer to that but it really does seem to be treated quite differently to the sense of sight and other things that we instantly recognize as being dangerous and something to avoid. Yeah. There's something really interesting going on there that we haven't really got to the bottom of.

JC: And is that an opportunity for us? I don't know if you've worked in this area at all. So I'm bringing this up cold. But do you think that are maybe opportunities for us to go into the schools and have some of these materials added to our science classes and health classes where our students are learning about good health practices?

EB: Yeah. Look, I think there's certainly some work which shows that if you can get to kids young enough and get that message through when they're at that primary school level, then you're going to be most effective. And so yeah. Certainly, I think there's an opportunity there. One of the things we've found when we've tried to put together a school program-- and I must say we probably could've approached it a little bit differently but we did have a lot of trouble getting interest from the schools. I'm sure it's similar in the US but in Australia, a lot of schools feel like they're being tasked with educating our kids about all sorts of things, drugs and safe sex and every other sort of risky behavior that you can care to name. And so because hearing isn't high up in the hierarchy of things that people think are hugely important, it just tends to get pushed down in the ranks of all the other things that the schools need to deal with. And so we found it quite hard to get traction there. But I think maybe if we'd approached it in terms of trying to be part of the science curriculum or tried to go in with schools that have bands, perhaps, and tried go into the music program where it might make a little bit more sense to people, then maybe we would've had a little bit more success. So I think we have to think about it a little bit differently and try and make it as relevant as possible and try and make it attractive for schools to pick up.

JC: Yeah. Absolutely. And that's an area where there aren't a lot of materials specifically targeted to that audience but perhaps that's something we can work on and try to address in the coming years because I-- on a couple fronts. One, getting to people early on in their life and setting those life-long habits and setting that mindset early is important. But the other thing that I've noticed - and, of course, I have kids ranging from 2nd grade until up to a sophomore in high school - the kids learn this stuff in school, they come home and tell their parents. Say, "Mommy, daddy, guess what they told me today? When you listen to that music really loud in the car--" And that's inevitably what happens after they learned it in school. And so you're automatically spreading the message with your little built-in messengers.

EB: Yeah. That's right. Yeah. And it goes across the generations and that could be a really powerful tool for getting across to more people than your initial audience, for sure.

JC: Yeah. Absolutely. So certainly encourage people to do that as well. But I just want to thank you so much for joining us here today on Conversations in Tinnitus and sharing your research and your experience and the other work you're doing through NLA and World Health Organization and just bringing us all your insights here today.

EB: Well, thanks very much for having me. And as I said, thank you so much for supporting our work and for helping us spread the message. It's been lovely chatting to you guys and meeting you over the internet. So thanks very much.

JC: Yes. And we've been speaking with Elizabeth Beach who is the department head of behavioral sciences at the National Acoustics Laboratory in Sidney, Australia. And so you may be our longest distance guest so far. So we'll give you that undistinguished award.

EB: Thanks very much.

JC: But it's been a distinct pleasure having you here for this conversation and we'll look at maybe having you back in a year or two when some of that other research is finalized and we have some more things to talk about.

EB: Yeah. I'd love to do that. Thanks very much.

JC: So again, I'm John Coverstone with Dean Flyger and we hope you'll join us next time for another *Conversations in Tinnitus*.

[music] The American Tinnitus Association is a non-profit organization dedicated to research, advocacy, education, and support for people who live with tinnitus. Gifts and donations to ATA are used to support research for a cure and other critical missions described on our website at www.ata.org.