

HEARsmart review of filtered earplugs helps music patrons decide which earplugs are best for listening to music

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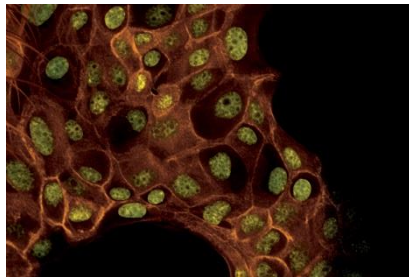
a: HEARing CRC

b: National Acoustic Laboratories

c: Acoustik

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creating sound value[™]



- Low rates for earplug use in Australia:
 - Goggin et al (2008) → 17%
 - McGinnity et al (2018) → 10-25%
- Need for unbiased, independent review of attenuation

Types of filtered earplugs



STUDY 1: Objective measurements

- To test performance of filtered earplugs in lab to provide independent review of attenuation and compare to manufacturers' claims

STUDY 2: Subjective measurements

- To test performance of filtered earplugs out in the field to investigate which features contributed most to overall acceptability

STUDY 1

- AS/NZS1270
- 20 participants per device
- Five sets of earplugs
- Did not receive anything but published guidance on fitting
- 1 lab session of 2 hours



STUDY 2

- Initial online survey
- Appointment with team member
- Two sets of earplugs
- Received fitting guidance
- Online surveys over 4 wks*



STUDY 1

- n = 100 (50 F)
- >18 years
- Normal hearing, Otoscopy✓
- Little/no experience with hearing protectors

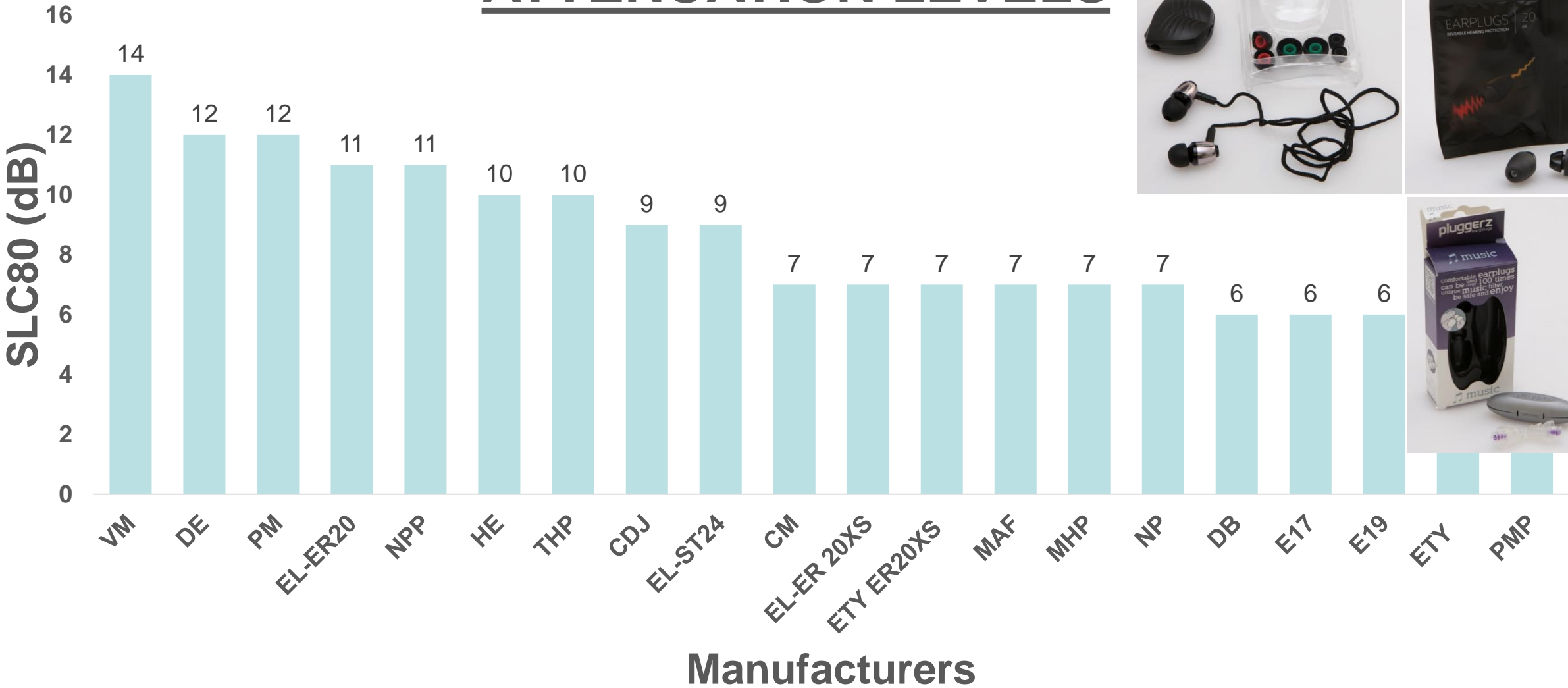


STUDY 2

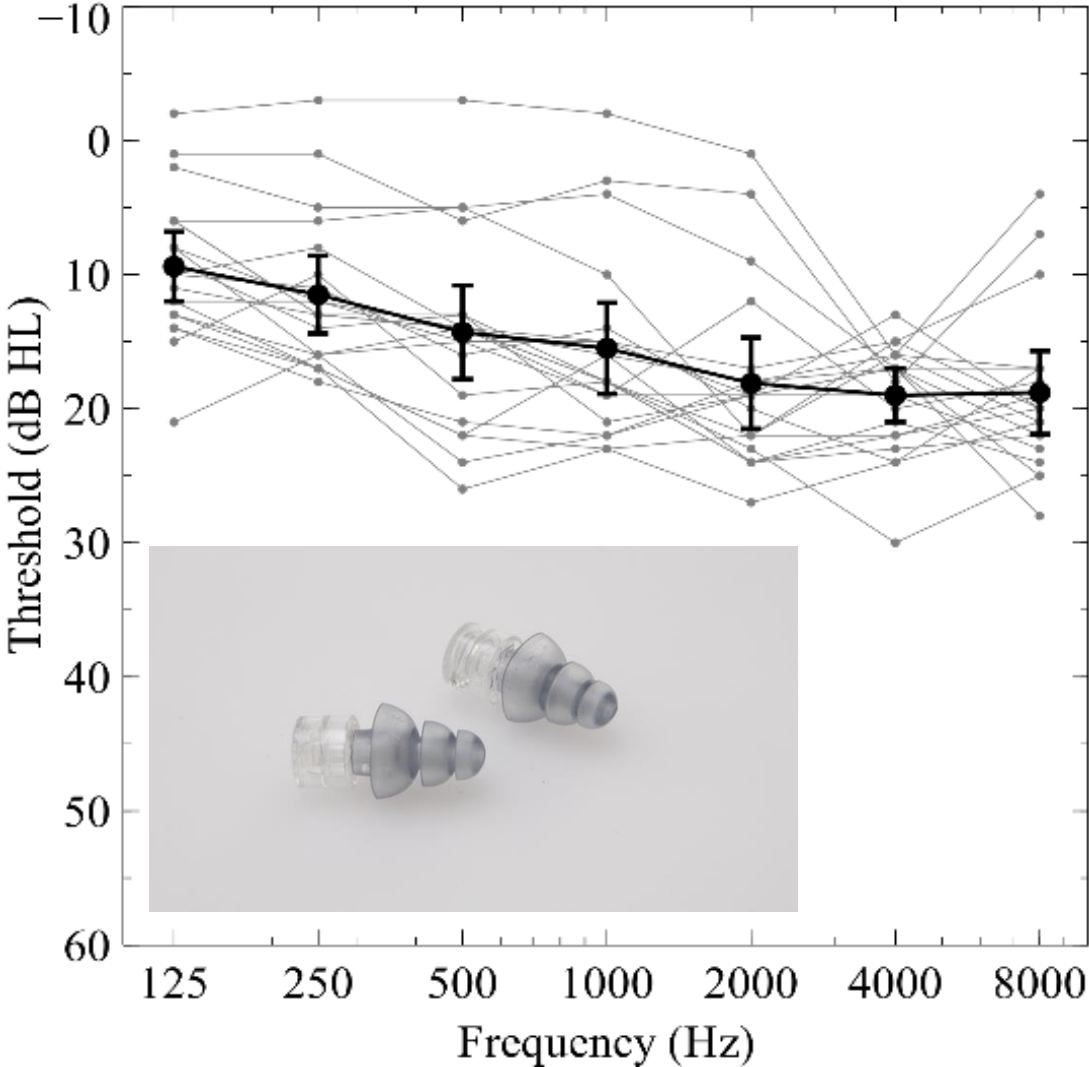
- n = 56 (23 F)
- >18 years
- Frequent attendance at live music venues
- 42/56 with experience using EPs



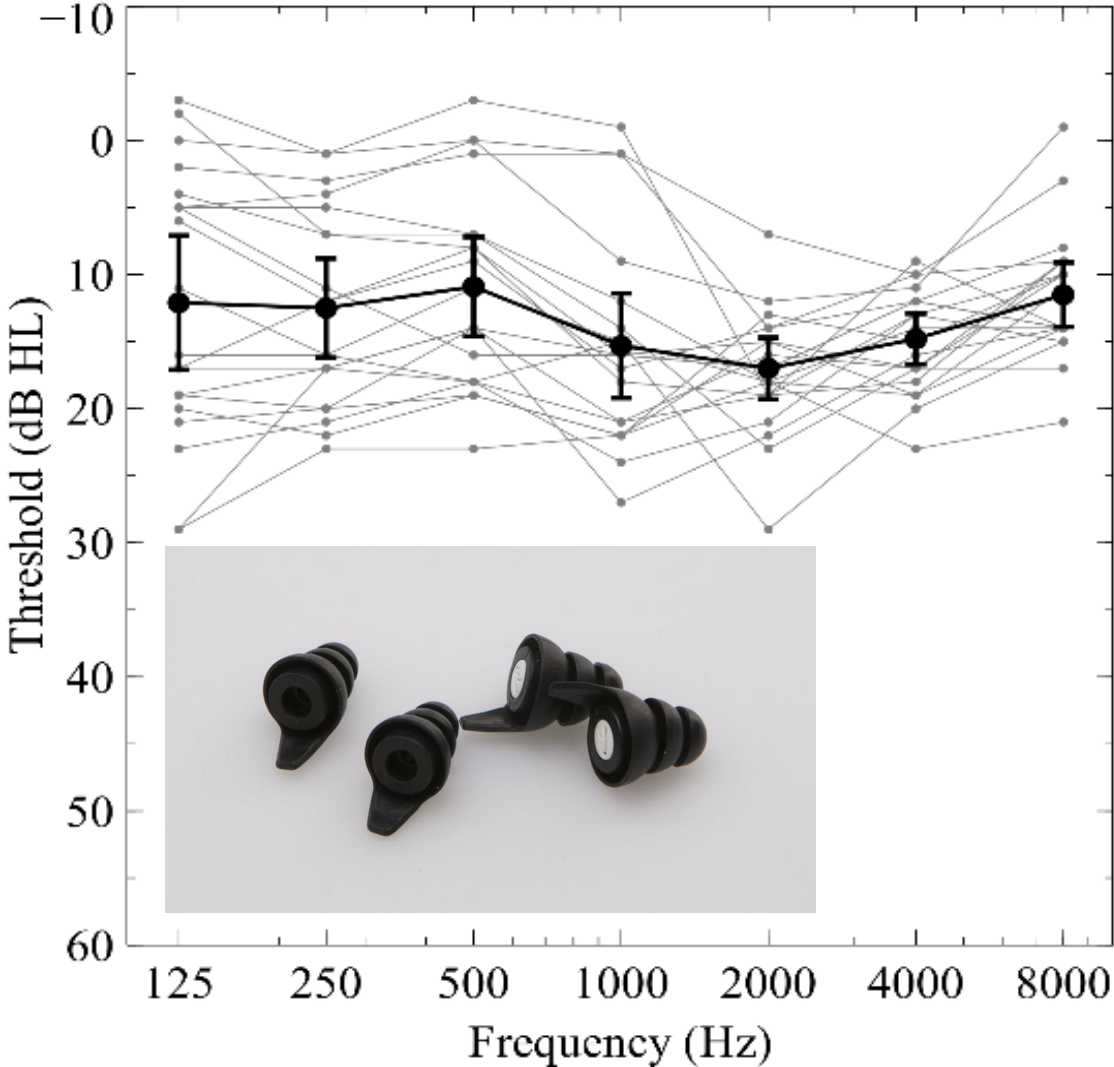
ATTENUATION LEVELS



EL-ER20XS

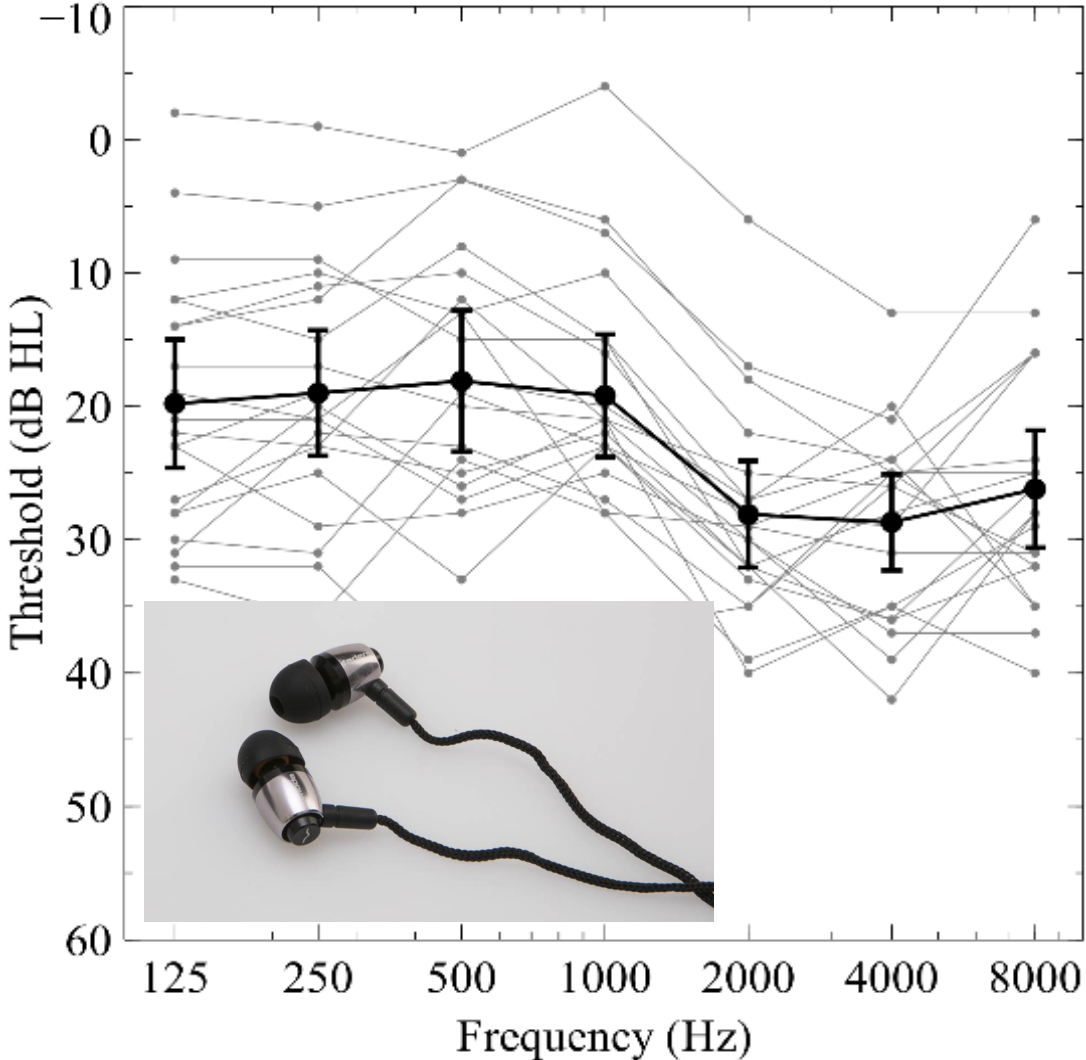


CDJ

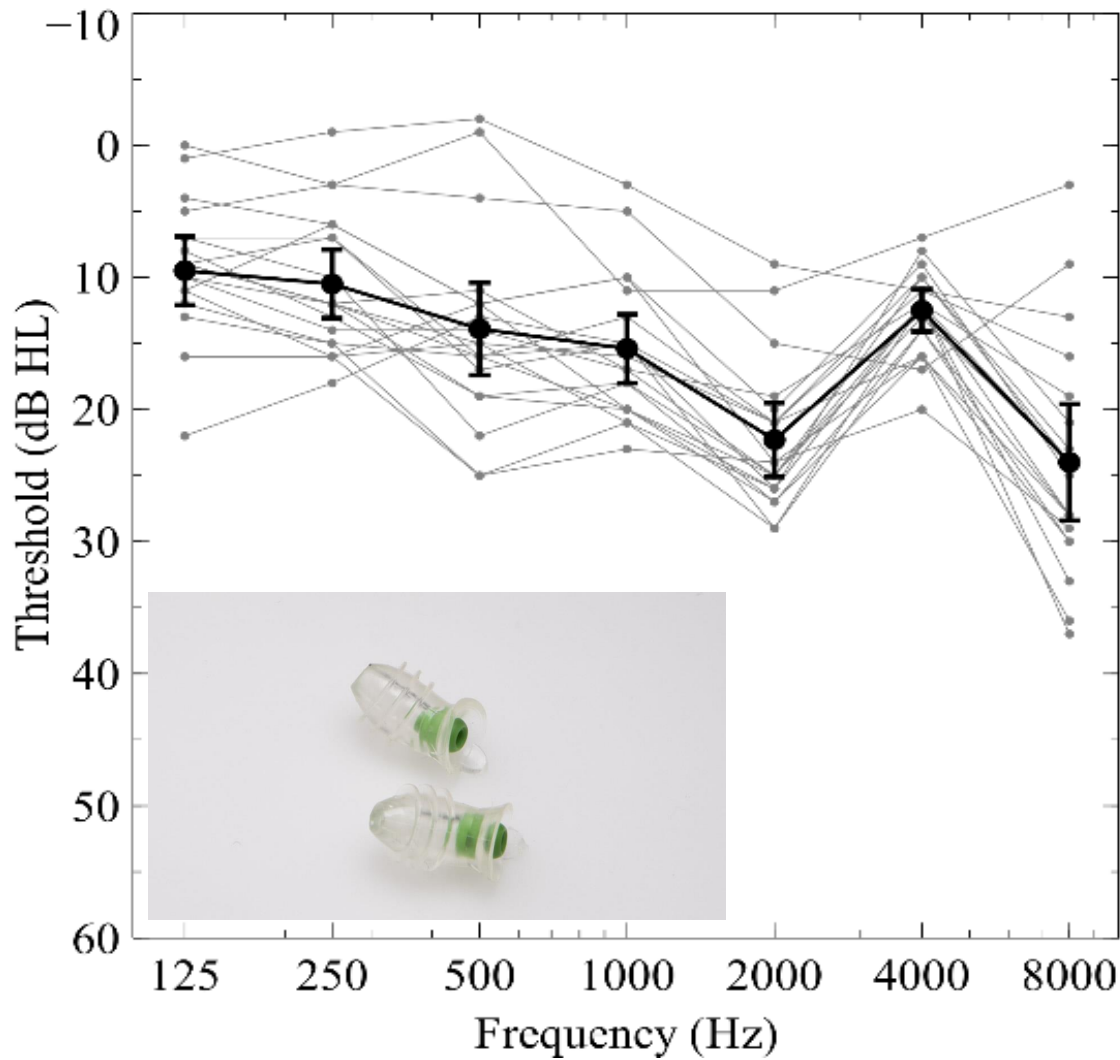


Results – Objective measurements (Study 1)

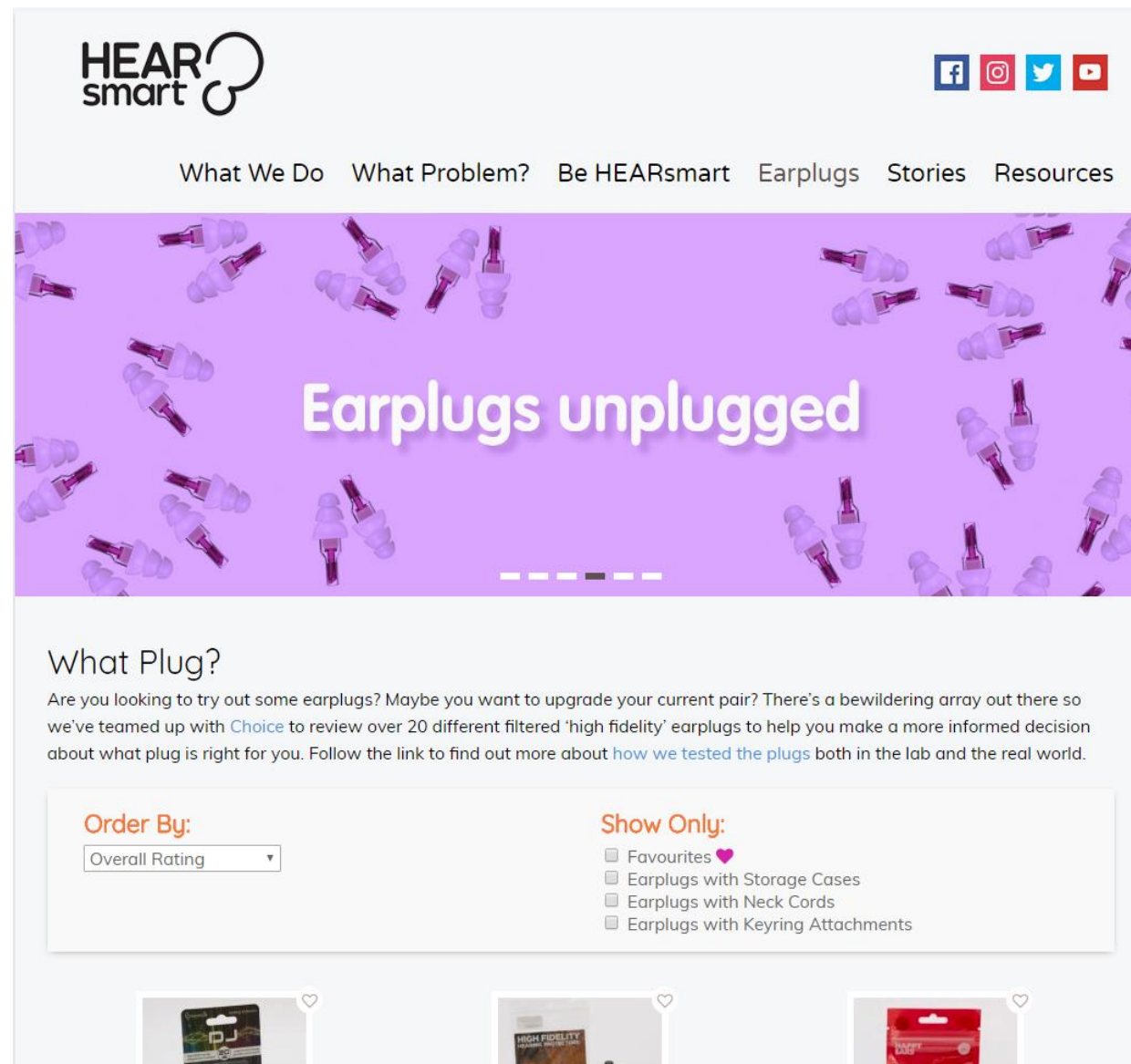
VM



NP



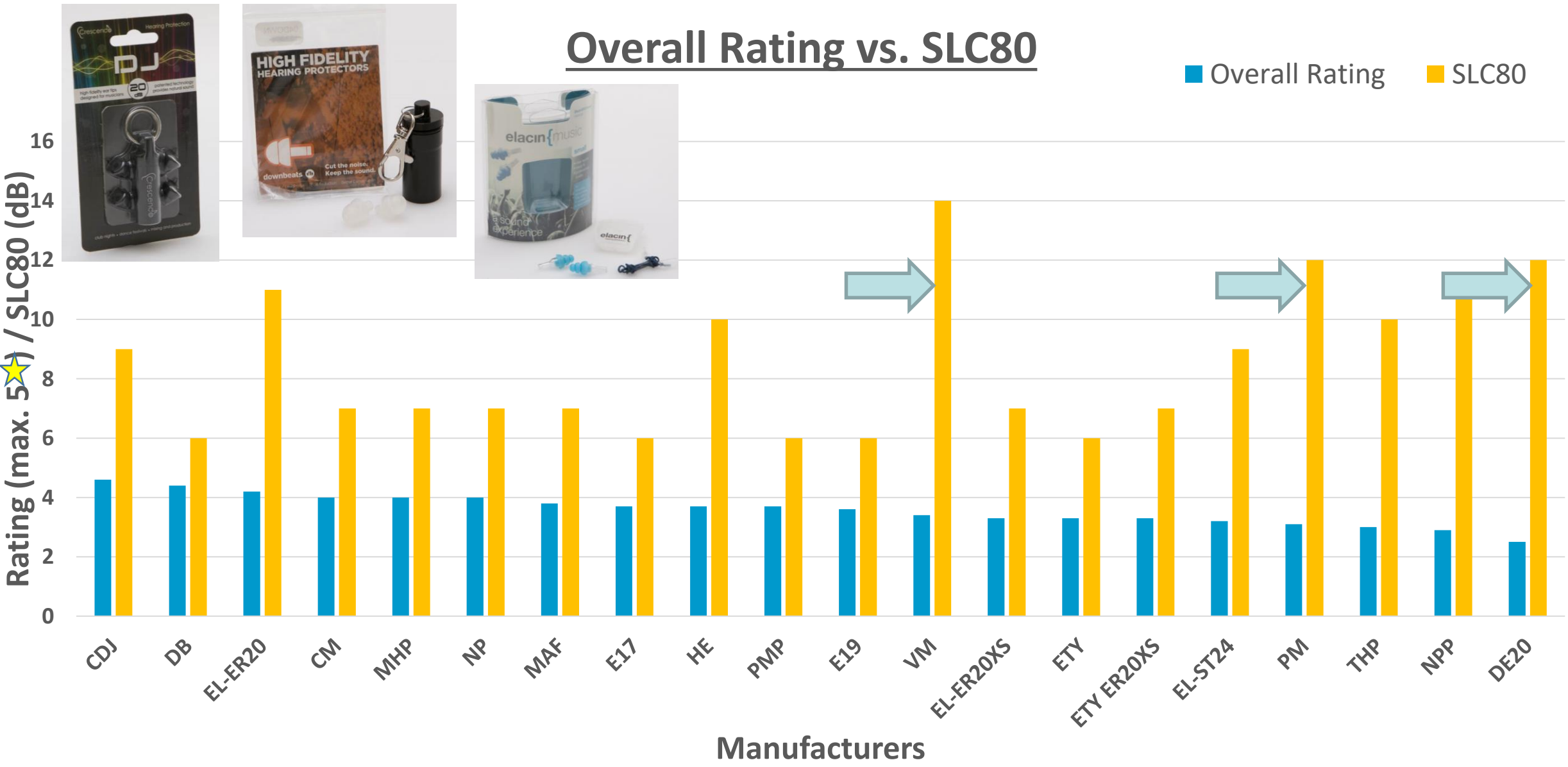
- Attenuation can vary hugely depending on the fit!
- Consumers beware of manufacturer claims!
- Consumers can refer to our earplug review on the HEARsmart website to check which earplugs offer the most attenuation.



The screenshot shows the HEARsmart website interface. At the top left is the HEARsmart logo, and at the top right are social media icons for Facebook, Instagram, Twitter, and YouTube. Below the logo is a navigation menu with links: "What We Do", "What Problem?", "Be HEARsmart", "Earplugs", "Stories", and "Resources". The main content area features a purple background with a pattern of earplugs and the text "Earplugs unplugged". Below this is a section titled "What Plug?" with a paragraph of text: "Are you looking to try out some earplugs? Maybe you want to upgrade your current pair? There's a bewildering array out there so we've teamed up with Choice to review over 20 different filtered 'high fidelity' earplugs to help you make a more informed decision about what plug is right for you. Follow the link to find out more about how we tested the plugs both in the lab and the real world." Below the text are two filter sections: "Order By:" with a dropdown menu set to "Overall Rating", and "Show Only:" with four checkboxes: "Favourites" (checked), "Earplugs with Storage Cases", "Earplugs with Neck Cords", and "Earplugs with Keyring Attachments". At the bottom, there are three product images with heart icons, representing different earplug models.

Results – Subjective measurements (Study 2)

Overall Rating vs. SLC80



Results – Subjective measurements (Study 2)

Categories	Overall Rating
Comfort	0.90**
Fit	0.83**
Discreetness	0.82**
Music Quality	0.76**
Appearance	0.73**
Effect on Conversation	0.57*
Ease of Handling	0.55*
Impact on Dancing	0.18

The NOIZEZZ are much more comfortable to wear and easier to insert. That is why I wore them more because you almost don't feel them when you have them in

I liked Pluggerz better simply because it was easier to take in and out. Earasers feel like they fit in my ear better but hard to quickly put in

They are virtually invisible, and fit nicely in your ear, but muffle the sound a little.

**p <0.05
*p <0.01

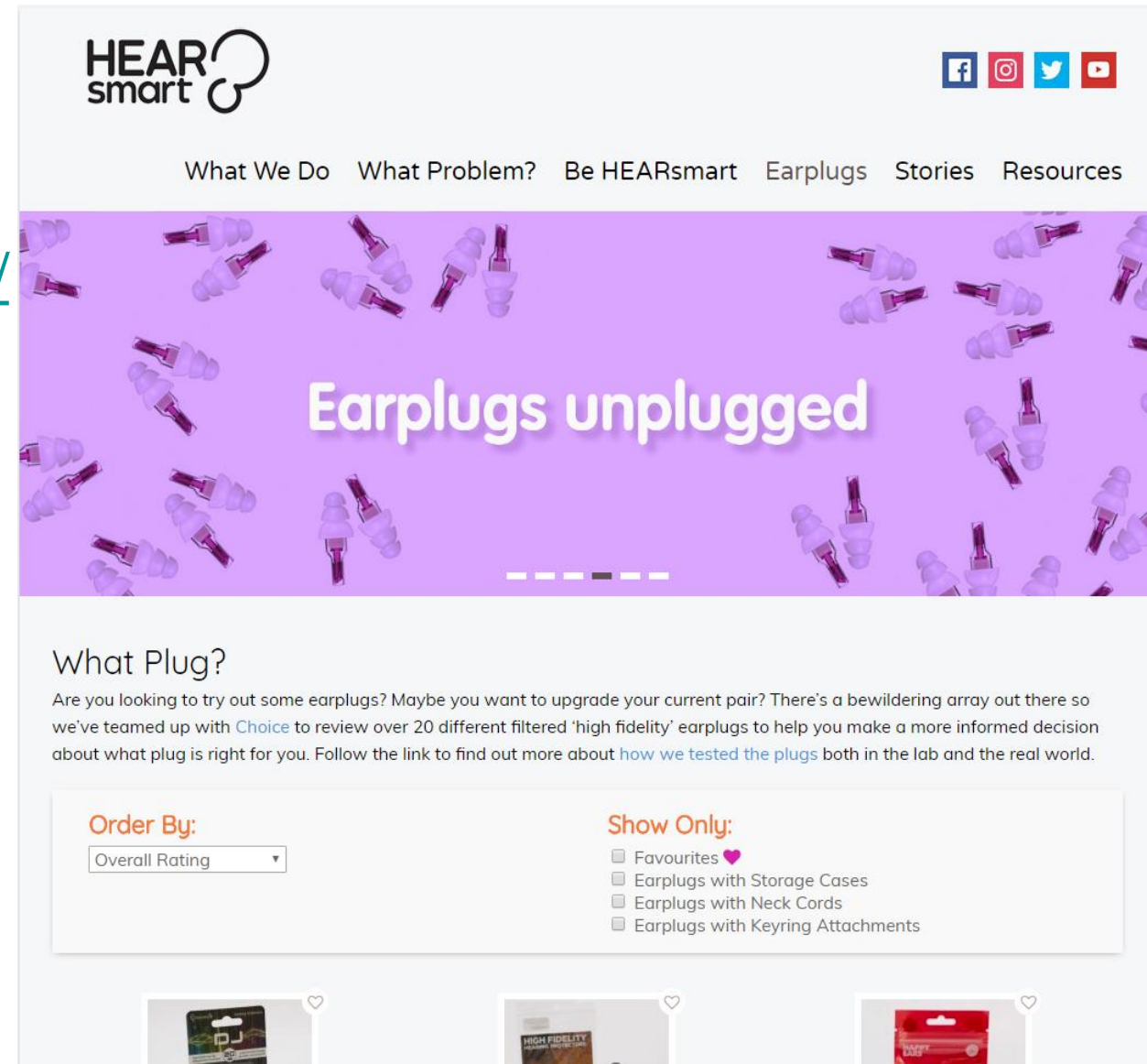
- HEARsmart What Plug

https://hearsmart.org/earplugs/what_plug/

- Encourage and Guide

- Old vs. New Styles

- Be the change!



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Australian/New Zealand Standard AS/NZS 1270: 2002 *Acoustics – Hearing Protectors*, fifth edition, Standard Australia, Sydney Australia.

Goggin, L. S., Eikelboom, R. H., Edwards, G. S., Maric, V., Anderson, J. R., Sander, P. B., ... & Rajan, G. P. (2008). Noise levels, hearing disturbances, and use of hearing protection at entertainment venues. *Australian and New Zealand Journal of Audiology*, 30(1), 50-58.

McGinnity et al (2018) Investigating the use of sound level management software in live indoor music venues *International Conference on Music-Induced Hearing Disorders, 2018 June 20–22, Chicago, IL, USA*

Williams, W., & Dillon, H. (2005). Hearing protector performance and standard deviation. *Noise and Health*, 7(28), 51-60.

Members + Acknowledgements

MEMBER ORGANISATIONS



Australian Government
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Business
Cooperative Research
Centres Programme

The CRC Programme supports industry led end-user driven research collaborations to address the major challenges facing Australia.

Thank you

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