Vintage and furr — dogs contribution to the "analogue vs digital" audiophile debate.

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1 General overview of the project, including relevance to science and/or society

> Introduction in which you describe relevant literature and identify how your research will contribute to the field.

This paper is meant to provide a non-human perspective to the almost half of the century debate about the (dis)advantages of the analogue vintage sound media (like longplays and tape) among audiophiles Uwins, 2015.

Study on humans conducted in Uwins, 2015 demonstrated, that vinyl aficionados perform poorly in blind test, rating mp3 and CD audio quality much higher than that of a vinyl. They also tend to contradict themselves, ascribing the "analogue warmth" to the digital medium. Importantly, the same paper reports, that the audiophiles advocate not the sole listening quality, but the whole experience of using the vintage equipment.

This however does not mean that vinyl records' "warmth" can be reduced to the latter, as they are many spectral characteristics and sound artifacts of the records that differ from those of CD. One of such differences is a different profile of the total harmonic distortion (THD) caused by the process of vinyl pressing Uwins, 2015.

2 Problem definition, goal and expected results

> Description of the proposed research in which you specify and motivate the research question and describe your hypothesis and possible findings.

This paper explores animal's sensitivity to jitter as the biological THD profile recognition system and to study the organism's preferences towards sounds generated using the vintage analogue and modern digital equipment.

Three numerous groups of dogs are to be assembled: dogs used to playing music from the standard household commercial digital audio systems, dogs of people identifying using solely analogue music equipment and shelter ownerless dogs (control group).

Based on the interactive audio device for white-faced sakis monkeys Piitulainen and Hirskyj-Douglas, 2020, a special jukebox (but adaopted for *Canis familiaris* species) is build for the animals to choose music during daily activities. The jukebox contains two playlists: one with the songs in mp3 encoding format, and another with tracks enhanced in such a way, that their THD characteristics resemble those of the vintage audio equipment. (As in the original experiment of Uwins, 2015, all tracks are digitalized). The jukebox has only one button in a form of horizontal pressure plate which randomly changes the track when the dog steps on it.

To encourage dog's interaction with the contraption, the jukebox's pressure plate is sprayed with dog's own urine contaminated with an olfactory modifier Horowitz, 2017.

The frequency and offset time of track changes is measured with regard to the track THD profile (mp3 or virtual analogue).

If the "analogue warmth" hypothesis holds, dogs from all the groups should be observed changing the track more often when jukebox plays a mere mp3 file. If this behaviour were observed only among canines having audiophile owner, it would proove recognizability of the analogue medium. If the opposite turns out to be the case (i.e. all the dogs change the "vintage" track to one of a mp3 encoding), it would replicate the results of Uwins, 2015, suggesting interspecial preferences. No statistically significant difference would render the whole "analogue vs digital" debate as perhaps pointless for another species.

3 Research methodology

> Describe and motivate the proposed methodology for gathering the results.

Since the introduction of the CD records in 1982, a debate about the superiority of analogue (longplays, tape) to digital (CD) audio media (or vice-versa) polarizes the audiophile community. Supporters of the vintage technologies claim that the digital sampling standard is faulty and cannot reproduce the so called "analogue warmth" well enough. The advertisers of the digital technologies respond that the mediumn does not matter that much after all.

As humans, animals are very spectral-sensitive. A study on the acoustic bases of human voice identity processing in dogs Gábor et al., 2022 found that — apart from the mean fundamental frequency — it is the voice *jitter* ("noisiness") that makes dogs differentiate owner's voice from other humans.

The experiment is desinged according to a framework proposed by Kriengwatana et al., 2022. Prepared definition of the music stimuli, focus on the well-studied sound property that the species of dog is known to be capable of discerning, and dog-friendly environment with caninocentric interaction artifact (pressure plate sprinkled with dog's urine) are meant to adopt the modality of the human music listening to more canine dimensionality.

References

Gábor, A., Kaszás, N., Faragó, T., Pérez Fraga, P., Lovas, M., & Andics, A. (2022). The acoustic bases of human voice identity processing in dogs. *Animal Cognition*, *25*(4), 905–916. https://doi.org/10.1007/s10071-022-01601-z

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Uwins, M. (2015). An investigation into perceptions of the audio. *Linear Audio*, *10*.