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# Abstracts

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# Hardware Guitar Amplifier Sounds vs. Simulation by the Kemper Profiling Amp: Discernibility of Sound Sources

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## **Empirical Background**

The technical means of special software to simulate expensive hardware have evolved over the last decades. Computer programs like Cubase enable users to produce music using sample libraries so that no real music instrument, musician or recording studio is required. In a previous study, we could show that non-expert listeners were not able to discriminate a recording of a live orchestra from one based on a high quality sample library, whereas experts showed a higher discrimination ability.

For about 20 years, modelling amplifiers (e.g., POD by Line 6) have been able to emulate the sound of a particular hardware guitar amplifier. However, differences between the original amp and the resulting model are still substantial. The Kemper Profiling Amp [KPA], developed in 2011 by the German company Kemper, uses a new approach to overcome these limitations by providing a device that is able to analyze the sound characteristics of a particular system and to produce a simulation that is supposedly “so close that you won’t be able to distinguish [it] from the original” (Kemper GmbH, 2017).

## **Aims**

The aim of this study is to determine the simulation quality of the KPA compared to the sound of two original amplifiers. We want to quantify the overall degree of discrimination between both sound sources and hypothesize that there will be differences between (a) subgroups of different levels of musical sophistication, and (b) non-electric-guitar-players, amateur electric-guitar-players, and professional electric-guitar-players.

## **Method**

Six musical examples differing in musical style were professionally recorded, each under both of the different recording conditions (via the original amp and via the profile using the KPA).

For the evaluation, a Signal Detection Paradigm and an online experiment are used. Participants are mostly (semi-)professional electric guitarists as well as others with presumably high sound discrimination skills (e.g., audio engineers). After explaining the features of the KPA and training audio examples, 14 stimuli are presented in random order including retests of two examples. Participants decide whether the example was produced using an original amp or via the KPA. Additionally, the quality of the audio equipment used by the participant is tested using an objective method. The Gold-MSI is used to determine the musical sophistication degree of each participant. Finally, the participants’ sociodemographic background and expertise concerning electric guitars and the KPA are surveyed.

## **Results**

The online survey is currently running, and the data collection will be completed in February 2018.

## **Conclusions**

To determine the quality with which the KPA can simulate the sound of an original amplifier is very important for professional electric guitarists and modern music production. The investigated device is already widely used by experts but also considered to have deficits. Our study will contribute to an objective discussion of the potential and limitations of modern digital music production in popular music.

## **References (selection)**

Kemper GmbH. (2017). The Kemper Profiler. Retrieved from <https://www.kemper-amps.com/profiler/overview>