

Some species of cicadas produce a high-frequency broadband noise with unusually high sound pressure levels.

This study is concerned with the environmental factor cicada song and whether it can impede the perception of /s/ and /ʃ/, potentially shaping the long-term development of human languages.

It is not possible to prove a causal relation between an environmental factor and the development of phonemic systems using the scientific method (which would at the very least require a control group).

Instead, this study takes two alternative approaches: first, and consistent with all previous studies concerned with the effects of environmental factors on language,

it tests for cross-linguistic evidence of a correlation, in this case between the presence of cicadas (in the environment) and the frequency of minimal pairs involving /s/ and /ʃ/.

Second, it extends previous research by taking a novel approach in which logically necessary causal relations are identified and tested. More specifically, the short- and mid-term effects of exposure

to cicada song on human listeners' speech perception are tested

in experiments involving Simultaneous Masking and Auditory Fatigue. In addition, audiograms

from long-term residents of rural (with cicada noise) and urban (without cicada noise) areas in Greece are

compared, to

determine whether long-term exposure to cicada song is associated with Permanent Hearing Damage.

Based on a sample of 11 languages, results

show that there is a negative correlation between the presence of

cicadas and the use of an /s/ and /ʃ/ contrast; cicada song is also shown to

cause short-, mid-term and permanent masking of sibilant contrasts.

Thus, results of this study support the hypothesis that cicada song can affect the shape of human languages.