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Understanding the communicative value of ultrasonic calls in male and female laboratory mice: implications for mouse models of neurodevelopmental disorders



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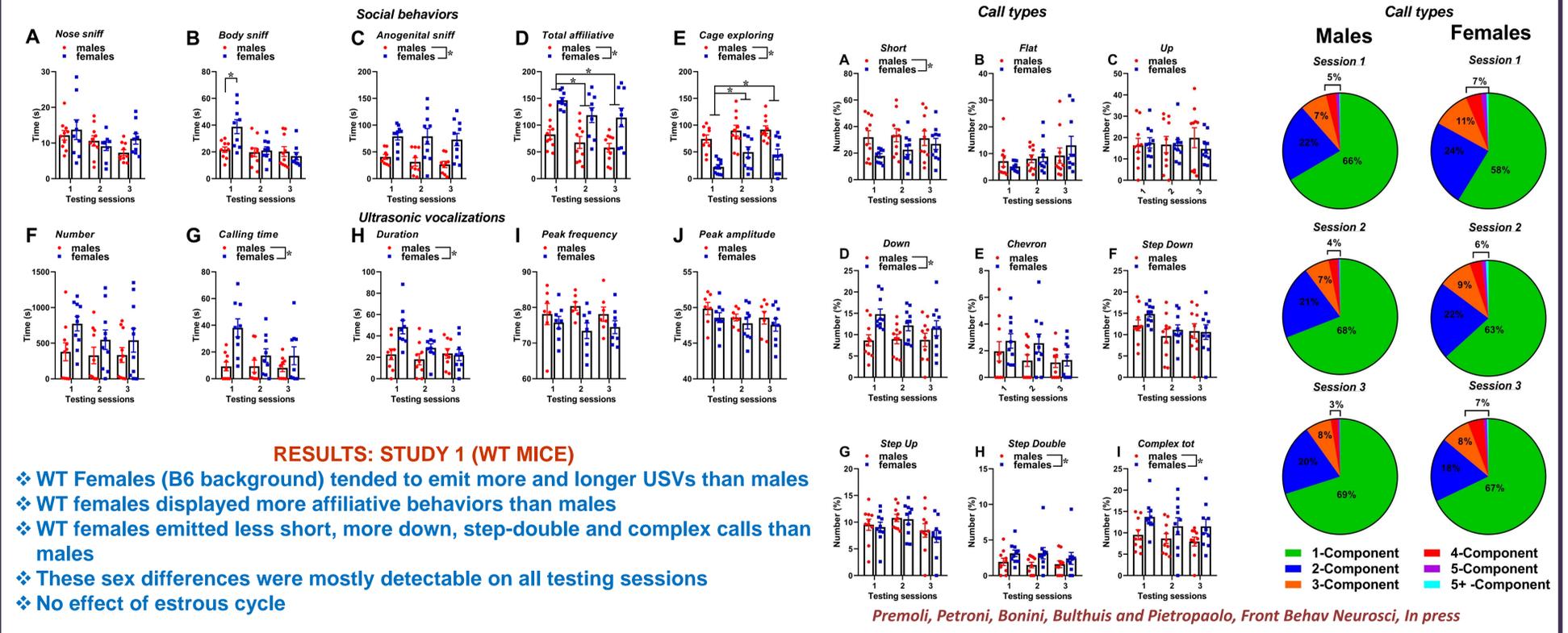
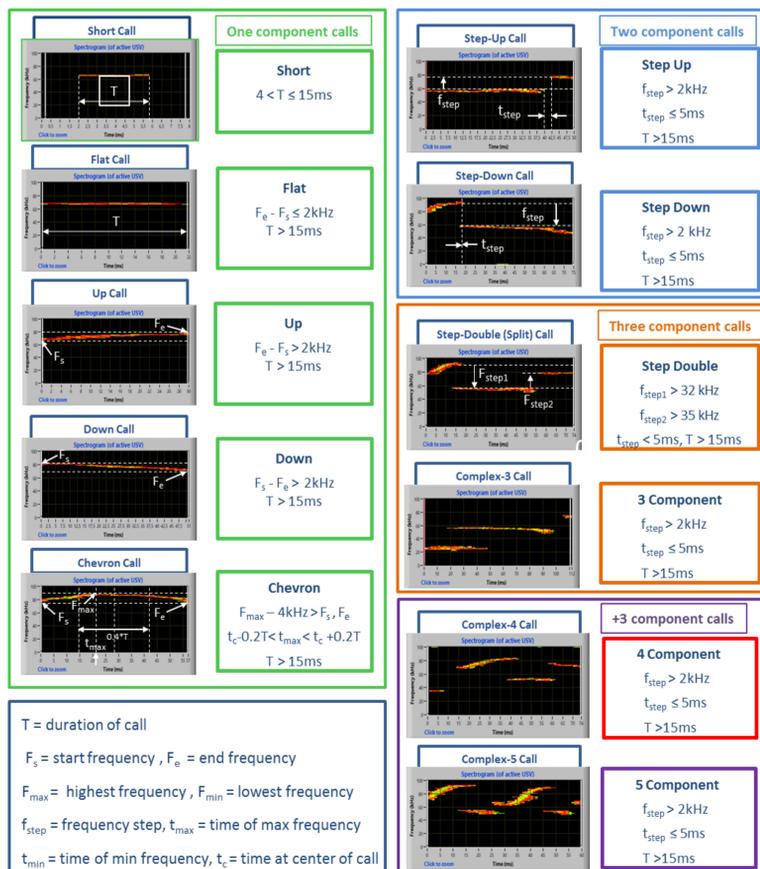


BACKGROUND

- ❖ Ultrasonic vocalizations (USVs) are a major tool for assessing social communication in laboratory mice during their entire lifespan.
- ❖ At adulthood, male mice preferentially emit USVs towards a female conspecific, while females mostly produce ultrasonic calls when facing an adult intruder of the same sex.
- ❖ Recent studies have largely developed several sophisticated tools to analyze adult mouse USVs, although the focus has been largely on males.
- ❖ Little is still known about the communicative value of the different types of ultrasonic calls emitted by adult male and female mice, an issue that is of particular relevance for the behavioral phenotyping of mouse models of Neurodevelopmental disorders (NDDs).

METHODS

- ❖ Female and male subjects (B6 background) encountered a CD1 female during 3 min
- ❖ Video files were scored with Observer XT (Noldus)
- ❖ USVs were recorded by Avisoft microphone and analyzed by Sonotrack (Metris).



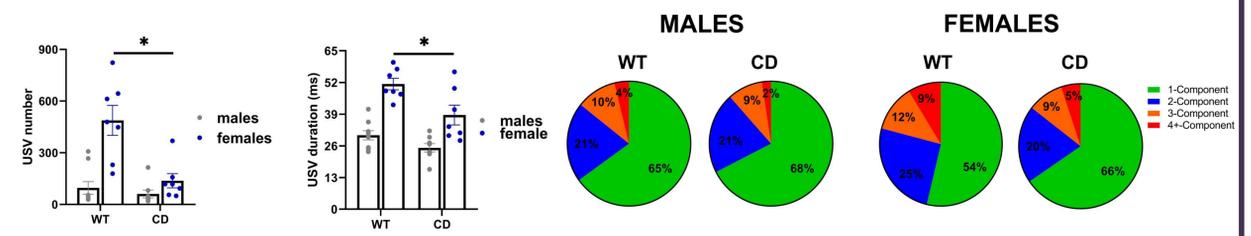
RESULTS: STUDY 1 (WT MICE)

- ❖ WT Females (B6 background) tended to emit more and longer USVs than males
- ❖ WT females displayed more affiliative behaviors than males
- ❖ WT females emitted less short, more down, step-double and complex calls than males
- ❖ These sex differences were mostly detectable on all testing sessions
- ❖ No effect of estrous cycle

Premoli, Petroni, Bonini, Bulthuis and Pietropaolo, Front Behav Neurosci, In press

RESULTS: STUDY 2 (CD MICE, MODEL OF WBS)

- ❖ CD Females (B6 background) emit less and shorter USVs than WT
- ❖ CD females emitted more 1 component calls and less complex (+3 components) calls than WT
- ❖ No genotype effect in males
- ❖ No effect of estrous cycle
- ❖ No difference in other social behaviors



CONCLUSIONS AND PERSPECTIVES

- ❖ Beside the number of USVs, parameters like the mean duration of the calls or the calling time are sensitive to sex and genotype differences.
- ❖ The qualitative analysis of the call types is useful to reveal subtle differences in communication phenotypes.
- ❖ The proportion of complex calls seems particularly sensitive to sex and genotype differences, suggesting their distinctive communicative potential.
- ❖ Female mice may be more interesting than males to investigate adult communicative patterns and their potential alterations in NDDs.

