



UNIVERSITÀ DEGLI STUDI  
DI TRENTO

MULTIMODAL EXPERIMENT

# HOW NOISE AFFECT SPOKEN WORDS RECOGNITION

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## Abstract:

In this experiment I will investigate how much noise is needed to get down recognizing performance of a spoken word. In order to test this phenomena, four experiments are developed and it will be tested four different noise condition: no-noise, 5 % of noise, 10 % of noise and 15 % of noise. In the first, the subject is committed to judge if the word heard match a present figure. In the second the task is the same, but now the subject have to match with a written word. For each part of these two experiment are considered congruent and incongruent condition between listen word and stimulus presented. The third part have to write the listen word. in the last experiment, memory test, the participant have to choose only images corresponding to the words listen in the three previous experiments. For each experiment reaction time (RT) and accuracy are recorded. The hypothesis is that increasing noise reduce the recognition significantly already with a little percentual of noise such as ten percent.

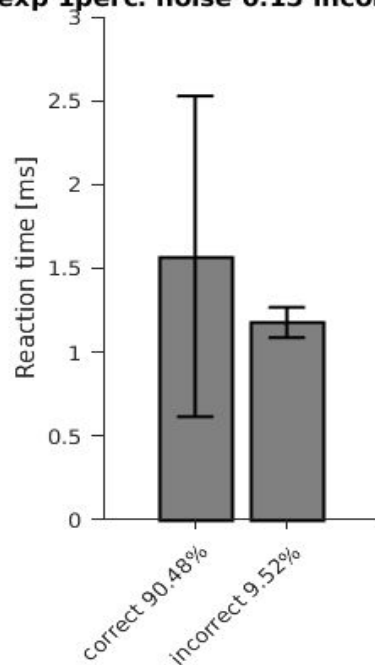


## Result:

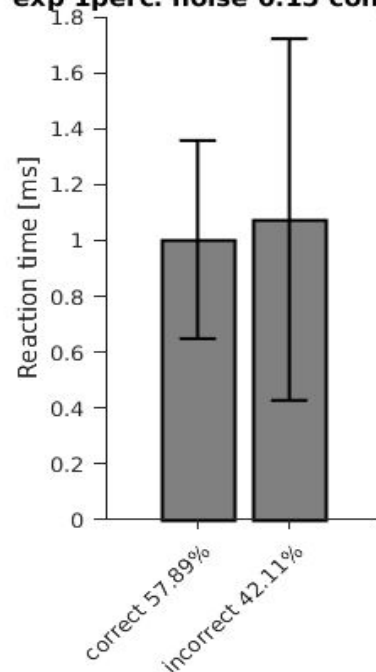
In the first part, as expected, no significant errors occur with a noise level of 0% (errors probably are done due to subject mistakes or inattention). Almost the same findings are showed with the 5% and 10 % of noise levels.

Interesting, with a noise level of 15 %, the congruent condition lead to an increase of errors in the congruent condition and the incongruent not ( as the graph below clearly shows). Not only but also, in this condition, reaction times increase sharply.

exp 1perc. noise 0.15 incongruent



exp 1perc. noise 0.15 congruent

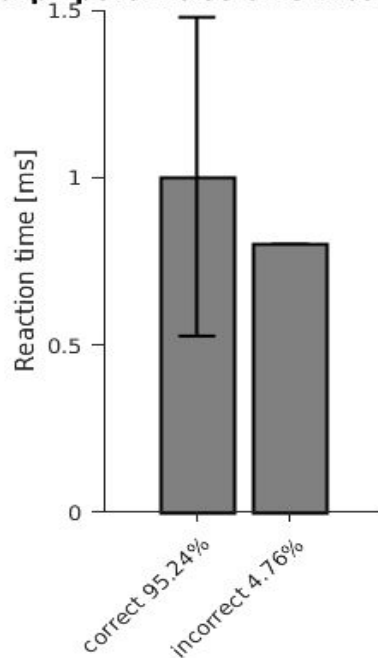


The second experiment shows almost the same findings of the previous one.

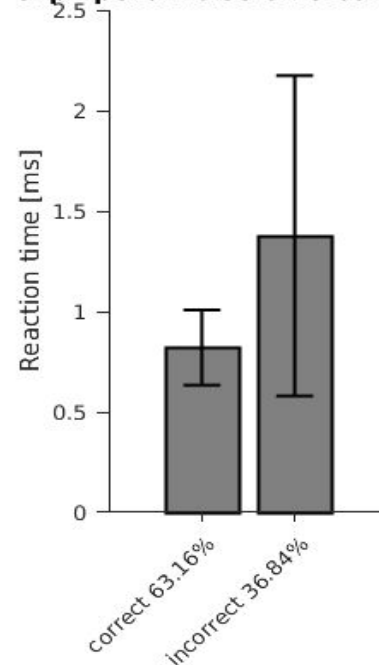


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exp 2perc. noise 0.15 incongruent



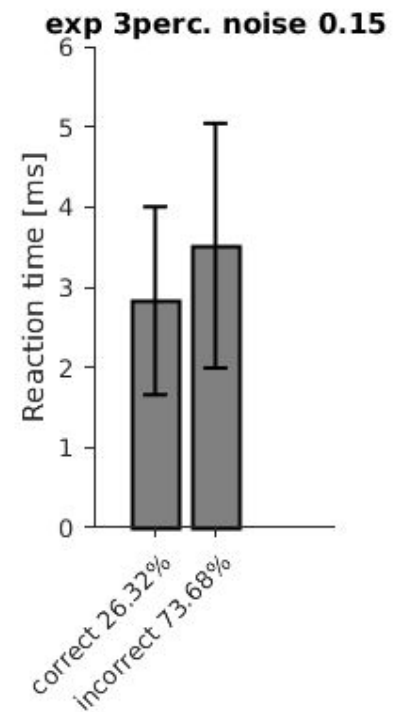
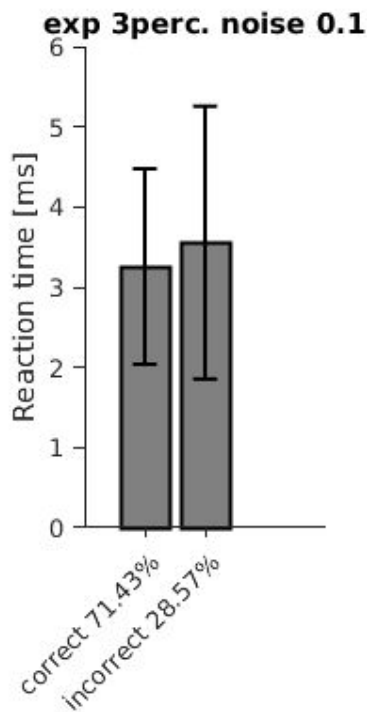
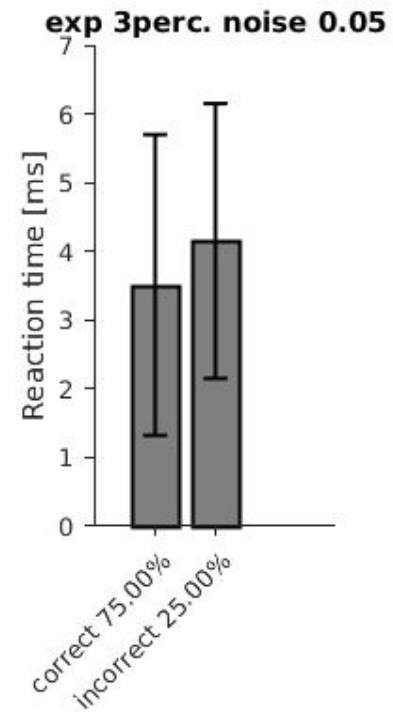
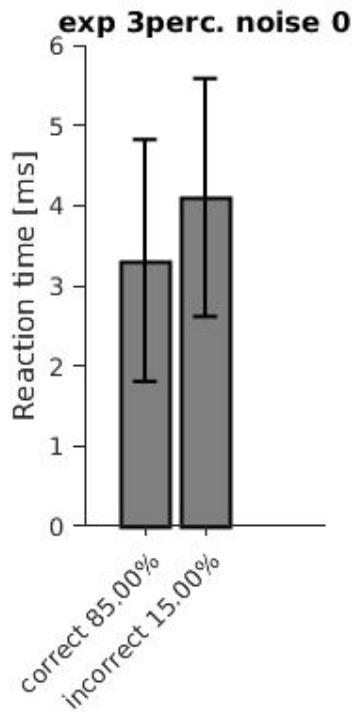
exp 2perc. noise 0.15 congruent



Striking, in the third experiment the effect of noise influence the performance incredibly. Here the noise effect play an important role. Accuracy's performance pass through 85 % without noise to almost 26 % of accuracy with a level noise of 15 %. Surprising, RTs are not affected by the noise factor.



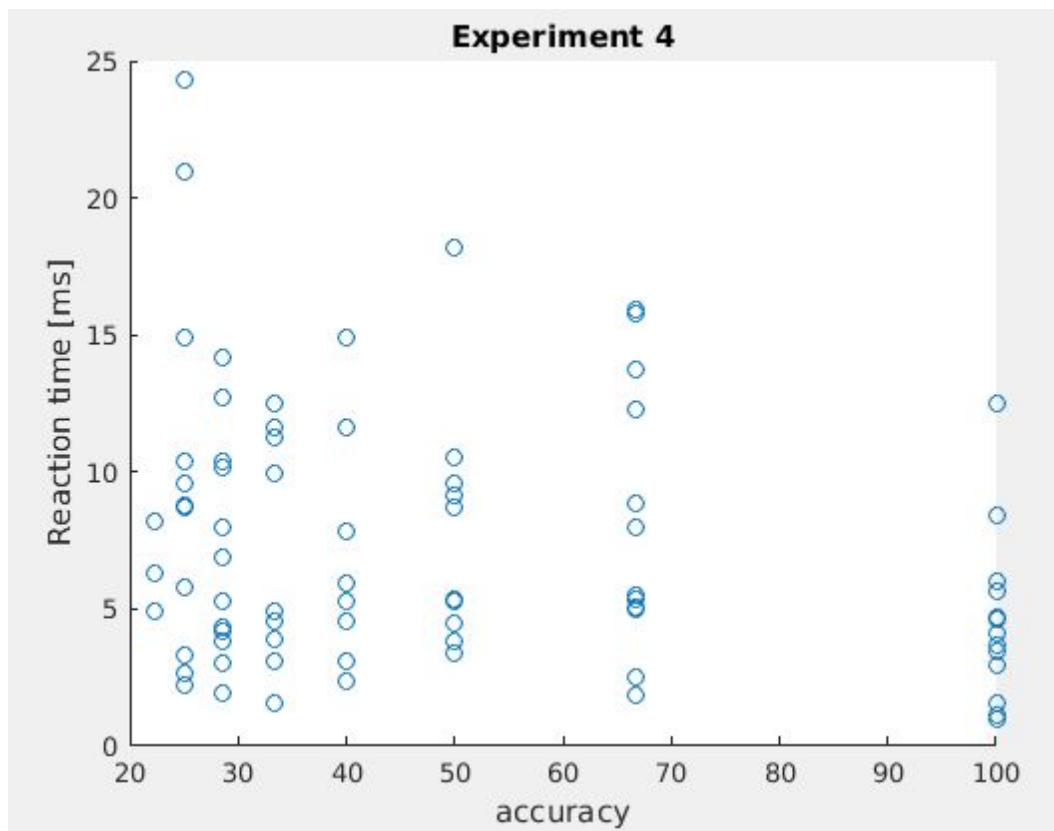
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In the last experiment, the significant evidence is that minor reaction time performance are related with a low level of accuracy and better reaction time performance are found with a great accuracy. Almost, the majority of the data are concentrated in the lower part of the accuracy.



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## Technical decisions:

- The choice of open and close PsychToolBox Screen before and after the experiment is due to the fact that the experiment will run in a single display setting (otherwise will be impossible to choose the experiment folder). In a laboratory with two displays it is possible to comment those code lines.
- It is necessary to choose the correct experiment's folder to load data (images, sounds and words)
- Timing is obtained with the command "**do nothing**" ( ; )

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