

# Turn up the beat! Groovy rhythm improves cognitive ability

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Dancing to musical rhythms is a universal human activity. But now, researchers from Japan have found that dancing doesn't just feel good, it also enhances brain function.

In a study recently published in *Scientific Reports*, researchers from the University of Tsukuba have revealed that [music](#) with a groove, known as groove music, can significantly increase measures of executive function and associated brain activity in participants who are familiar with the music.

Music that elicits the sensation of groove can elicit feelings of pleasure and enhance behavioral arousal levels. Exercise, which has similar positive effects, is known to enhance executive function. Accordingly, this may also be an effect of listening to groove music. However, no studies have examined the effect of groove music on executive function or [brain activity](#) in regions associated with executive function, such as the left dorsolateral prefrontal cortex (l-DLPFC), which the researchers at University of Tsukuba aimed to address.

"Groove rhythms elicit groove sensations and positive affective responses. However, whether they influence executive function is unknown," says lead author of the study Professor Hideaki Soya. "Accordingly, in the present study, we conducted brain imaging to evaluate corresponding changes in executive function, and measured individual psychological responses to groove music."

To do this, the researchers performed functional near-[infrared spectroscopy](#) (fNIRS) with a color-word matching task to examine inhibitory executive function before and after listening to music. They also conducted a survey about the subjective experience of listening to groove music.

"The results were surprising," explains Professor Soya. "We found that groove rhythm enhanced executive function and activity in the l-DLPFC only in participants who reported that the music elicited a strong groove sensation and the sensation of being clear-headed."

In fact, these psychological responses to listening to groove rhythm could predict changes in executive function and I-DLPFC activity.

"Our findings indicate that [individual differences](#) in psychological responses to groove music modulate the corresponding effects on executive function. As such, the effects of groove [rhythm](#) on human cognitive performance may be influenced by familiarity or beat processing ability," says Professor Soya.

Strategies for enhancing executive function have a wide range of potential applications, from preventing dementia in [elderly people](#) to helping employees enhance their performance. Furthermore, the positive effects of groove music on [executive](#) function could include the effects of positive emotions and of rhythmic synchronization. This could help to explain the many positive benefits of dancing, or any form of exercise conducted while listening to music. Further research is needed to develop applications for this new information.

**More information:** Takemune Fukuie et al, Groove rhythm stimulates prefrontal cortex function in groove enjoyers, *Scientific Reports* (2022). [DOI: 10.1038/s41598-022-11324-3](https://doi.org/10.1038/s41598-022-11324-3)

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