

# Meditation increases the depth of information processing...

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Full title: Meditation increases the depth of information processing and improves the allocation of attention in space.

During meditation, practitioners are required to center their attention on a specific object for extended periods of time. When their thoughts get diverted, they learn to quickly disengage from the distracter. We hypothesized that learning to respond to the dual demand of engaging attention on specific objects and disengaging quickly from distracters enhances the efficiency by which meditation practitioners can allocate attention. We tested this hypothesis in a global-to-local task while measuring electroencephalographic activity from a group of eight highly trained Buddhist monks and nuns and a group of eight age and education matched controls with no previous meditation experience. Specifically, we investigated the effect of attentional training on the global precedence effect, i.e., faster detection of targets on a global than on a local level. We expected to find a reduced global precedence effect in meditation practitioners but not in controls, reflecting that meditators can more quickly disengage their attention from the dominant global level. Analysis of reaction times confirmed this prediction. To investigate the underlying changes in brain activity and their time course, we analyzed event-related potentials. Meditators showed an enhanced ability to select the respective target level, as reflected by enhanced processing of target level information. In contrast with control group, which showed a local target selection effect only in the P1 and a global target selection effect in the P3 component, meditators showed effects of local information processing in the P1, N2, and P3 and of global processing for the N1, N2, and P3. Thus, meditators seem to display enhanced depth of processing. In addition, meditation altered the uptake of information such that meditators selected target level information earlier in the processing sequence than controls. In a longitudinal experiment, we could replicate the behavioral effects, suggesting that meditation modulates attention already after a 4-day meditation retreat. Together, these results suggest that practicing meditation enhances the speed with which attention can be allocated and relocated, thus increasing the depth of information processing and reducing response latency.

Front Hum Neurosci. 2012;6:133. Epub 2012 May 15. van Leeuwen S, Singer W, Melloni L. Department of Neurophysiology, Max Planck Institute for Brain Research Frankfurt am Main, Germany.

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