

Specific hypnotizability-related EEG signatures of motor imagery

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Background and objective: Motor imagery (MI) can improve motor performance and counteract neurological impairment, although its effectiveness varies across individuals according to hypnotizability levels. The study investigated whether not only highly hypnotizable (highs), but also medium (mediums) and low hypnotizable individuals (lows) can improve their actual and imagined motor performance through MI training (MIT).

Methods: Participants underwent EEG during baseline (B), movement (M) and MI (kinesthetic,K;visual,V), repeated after 2-week, 2-month MIT, and 1 month post-interruption (S1-S4). Power spectral density (PSD) was computed for theta, alpha, mu, low- and high-beta rhythms. Subjective MI efficacy (Ke,Ve) and chronometric indices (CI) were recorded.

Results: All participants improved their MI across the four sessions. Significant Session×Modality interaction revealed that Ve increased after training and survived its interruption, whereas Ke decreased. CI Session×Modality showed greater Ve than Ke in S1. Significant Session×Task emerged for mu, theta, alpha, and low-beta. Theta Side×Task×Group showed no effects in highs, efficient V in lows, and right-side activation without imagery efficacy in mediums. Low-beta Side×Task×Group showed V and K<B and no differences between V and M in highs. High-beta Session×Group showed lows<mediums in S2 and highs<mediums in S3.

Discussion: MIT was effective on Ve and PSD independently from hypnotizability and its effects were maintained after MIT interruption. Independently from subjective and behavioral variables, theta and low-beta reflected hypnotizability-related differences in lateralization and task performance. High-beta highlighted between-group differences in MIT effects, with mediums -70% of population- showing lower task engagement. This indicates that not only highs can benefit from MIT.

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