

# **Guidance or Interference? Augmented Feedback Benefits Bimanual Coordination Even After Removal**

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Previous studies have shown that learning bimanual coordination is more resistant to the removal of feedback when acquired with auditory feedback than with visual feedback. However, it is unclear whether this differential “guidance effect” between feedback modalities is due to better sensorimotor integration via the non-dominant auditory feedback channel or better linkage to kinesthetic information under rhythmic input. The current study was aimed to distinguish how modalities (visual vs. auditory) and information types (visuospatial vs. rhythmic) of concurrent augmented feedback influence bimanual coordination learning. Specifically, feedback provided were Lissajous plot indicating the integrated position of both arms and visual or auditory rhythm reflecting the relative timing of the movement. The results showed differential progression of error reduction under these three conditions during acquisition and diverse performance change depending on feedback condition after acquisition when feedback was removed, implicating that the guidance effect could be jointly determined by modality and information type of feedback. Furthermore, a similar tune-in effect shown in an additional no-feedback interference task suggested that an internal control strategy could have been acquired. Feedback removal may shift participants’ attention from external to internal focus, and such a conscious control strategy of movement may actually interfere with bimanual coordination.

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