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### **Authors**

Ishikawa, Ryota

Sasaki, Kyohei

Ayabe-Kanamura, Saho

et al.

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# **Learning to control the others body facilitates the embodied perspective taking**

**Ryota Ishikawa**

University of Tsukuba, Tsukuba, Ibaraki, Japan

**Kyohei Sasaki**

University of Tsukuba, Tsukuba, Japan

**Saho Ayabe-Kanamura**

University of Tsukuba, Tsukuba, Ibaraki, Japan

**Jun Izawa**

University of Tsukuba, Tsukuba, Japan

## **Abstract**

Perspective taking, a cognitive process of understanding information from the others viewpoint, is essential for forming communication skills. Whereas this process is considered to involve detachment of the reference frame from the own eye and attachment of it to the others eye, we instead hypothesized here that it is mediated by representing the others intrinsic (i.e., proprioceptive) coordinate frame, since our cognitive abilities often rely on the physical presence. To examine this possibility, we asked the participants to learn to control avatars motion in the virtual reality space from the third-person perspective and sought interaction between the ability to represent avatars intrinsic coordinate systems via motor adaptation and the ability to take avatars spatial perspective. We found significant facilitation of perspective taking ability by the motor adaptation experience, which supports our hypothesis that the perspective taking encompasses a process of representing the others intrinsic coordinate frame. We suggest that the perspective taking is an embodied cognitive process which underpins theory of mind and empathy.