Multisensory Research

Body Pitch Together with Translational Body Motion Biases the Subjective Haptic Vertical

Chia-Huei Tseng^{1,*,**}, Hiu Mei Chow^{2,*}, Lothar Spillmann³, Matt Oxner⁴ and Kenzo Sakurai⁵

¹Research Institute of Electrical Communication, Tohoku University, Sendai, 02342, Japan
²Department of Psychology, St. Thomas University, Fredericton, E3B 5G3, Canada
³Neurology Clinic, University of Freiburg, 79106 Freiburg, Germany
⁴Wilhelm Wundt Institute of Psychology, University of Leipzig, 04109 Leipzig, Germany
⁵Department of Human Science, Tohoku Gakuin University, Sendai, 981-3193, Japan
*Tseng and Chow contributed equally.
**Corresponding author; e-mail: CH_Tseng@alumni.uci.edu
ORCID iDs: Tseng: 0000-0002-6385-5669; Chow: 0000-0001-6294-1189

Supplementary Material

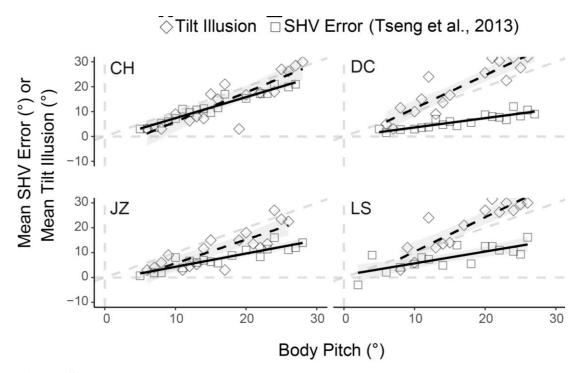


Figure S1. Comparison of mean subjective haptic vertical (SHV) error and mean tilt illusion plotted against body pitch for four observers who completed both conditions. The tilt illusion was larger than the SHV error in three out of four observers (DC, JZ, LS). Tilt illusion was comparable to the SHV error in observer CH. Individual data of four remaining observers who provided data on SHV but not tilt illusion were included in Supplementary Fig. S2 (AC, BC, LF, MO). Note that CH, DC and LS are authors of this paper.

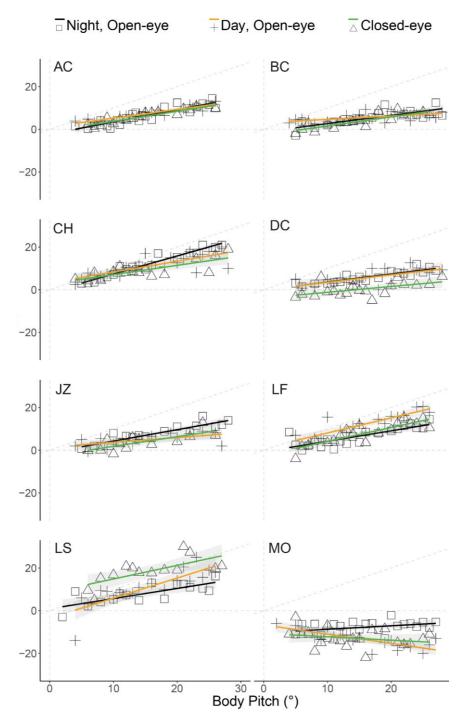


Figure S2. The influence of visual cue manipulation on the subjective haptic vertical (SHV) error in eight observers. The SHV error became larger with body pitch in all observers except for MO. There are large interindividual differences between the effects of visual cue manipulation on the regression slope of the SHV error in the remaining seven observers. Relative to nighttime measurements (black lines), daytime measurements (orange lines) increased the regression slope in LF and LS, reduced the regression slope in CH and JZ, or induced no change in AC, BC and DC. Relative to nighttime measurements (black lines), taking measurements with eyes

closed (green lines) reduced the regression slope in CH and JZ and induced no change in slope in AC, BC, DC (decrease in intercept), LF and LS (increase in intercept). Note that CH, DC, LS and MO are authors of this paper.

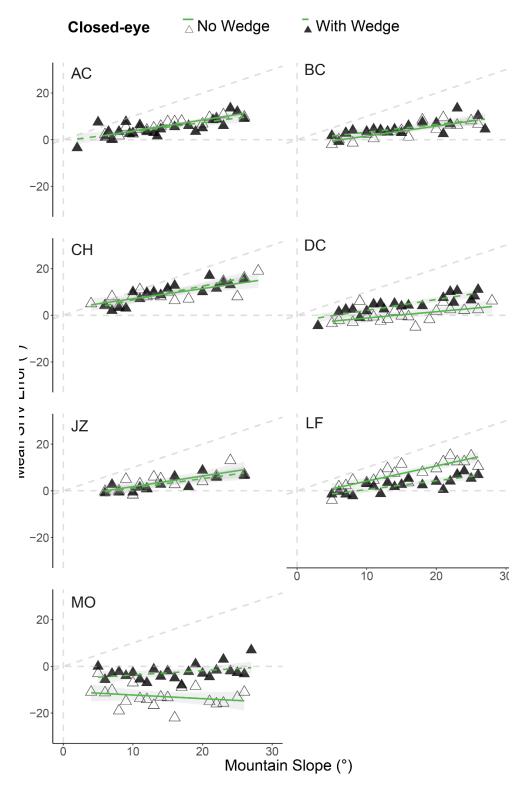


Figure S3. The influence of changing body pitch on subjective haptic vertical (SHV) error in seven observers. Inserting a back wedge (dashed line, solid shape) induced no change in the intercept or the regression slope of SHV error when plotted against mountain slope in four out of seven observers (AC, BC, CH, JZ), except for LF (decreased slope), DC (increased slope) and MO (intercept shifted closer to zero). Note that CH, DC and MO are authors of this paper.