Study information

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| Title | Cognitive suppression of tilt sensations during linear horizontal self-motion in the dark |
| Authors | Wertheim, Mesland & Bles (2001) |
| Hypotheses | A prior cognition of how one is moved affects one’s sensitivity for low-amplitude outputs of the otolith low-pass frequency filter – ie one’s sensitivity for tilt percepts during passive horizontal linear self-motion. |

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| Data collection | **Procedure:** Subjects were moved on a horizontal linear track sled. In the main study displacement estimates were recorded if only HOR (table1) motion was reported.  **Information/Instruction:** They were told they would participate in an experiment about self-motion perception. In the main study they were all completely unaware of the existence of the linear acceleration sled. // They were going to be seated in some kind of fun-fare attraction, which might make any movement one could imagine  **It was controlled for:**   * Vision (blindfold) * Sound of the sled (white noise) * air-flow (tent like structure) * tactile information from the sled (vibration device) |
| Sample size | 18 paid volunteer (20-30 years) participated in the main experiment, 8 subjects (20-47 years) in the separate control experiment. |

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| Variables | **Motion profile:**  Four sinusoidal motion profiles plus a stationary control condition were used in random order (10 subjects, with the rest a latin-square design without the stationary control condition was used). Each profile consisted of five periods of forward and backward motion. |

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| Control study | The subjects were sinusoidally moved on the sled for a continuous period of 30 min. They saw the sled before they were seated, and sound, vibration and air-flow were not masked. They were explicitly told that they might experience illusory tilt percepts and were instructed to report on them. Some of the subjects were moved at a maximum acceleration of 0.2g and with a frequency of 0.17 Hz, the rest were moved according to motion profile C. |

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| Results | The responses could be roughly divided into five categories:   * Linear horizontal motion only, in purely forward and backward directions (HOR) * Linear horizontal motion in forward and backward direction combined with tilt sensations in the forward/backward – vertical plane (X – Z) at the turning points (HOR + TILT) * Moving to and fro along a “hilltop-like” curved path in the X – Z plane (HILL) * Angular swing-like sensation in the X – Z plane (SWING) * Moving linearly along a tilted path in the X – Z plane, either upwards or downwards (SLOPE) {a difference in slope between forward and backward motion was always reported, most often downward in forward and upward in backward direction (usually the former was also experienced as stronger, than the later) in some cases slope was only perceived in forward motion}     Only one subject reported experiencing motion outside the X – Z plane, describing it as motion slanting to the left and right. This subjects’ data was excluded from analysis. None of the subjects who were given the stationary control condition reported it to yield any motion sensation.    **Results control study:** All subjects reported only purely linear horizontal to-and-fro motion during their first five motion periods. Tilt percepts did not occur until after 53 sinusoids in the earliest case and 230 sinusoids in the latest case. |