

**Numerical estimation in blind subjects:
Evidence of the impact of blindness and its following experience**

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ABSTRACT

Vision was for a long time considered as essential in the elaboration of the semantic numerical representation. However, early visual deprivation does not seem to preclude the development of a spatial continuum oriented from left to right to represent numbers (Castronovo & Seron, 2007; Szűcs & Csépe, 2005). Here we investigated the impact of blindness and its following experience on the third property of the mental number line: its obedience to Weber's law. A group of blind participants and a group of sighted subjects were submitted to two numerical estimation tasks: 1) key-press estimation task; 2) auditory events estimation task. Blind and sighted participants' performance obeys Weber's law. However, blind participants presented better numerical estimation abilities compared to sighted subjects, especially in context involving proprioception, indicating the existence of better mapping abilities between the symbolic representations of numbers and their corresponding magnitude representations obeying Weber's law (e.g., Lipton & Spelke, 2005). These findings suggest that blindness and its following experience with numbers might result in better accuracy in numerical processing.

Keywords: numerical estimation; blindness; semantic numerical representation