Perception is a complex process, where prior knowledge exerts a fundamental influence over what we see. The use of priors is at the basis of the well-known phenomenon of central tendency: Judgments of almost all quantities (such as length, duration, and number) tend to gravitate toward their mean magnitude. Although such context-dependency is universal in adult perceptual judgments, how it develops with age remains unknown. We asked children from 7 to 14 years of age and adults to reproduce lengths of stimuli drawn from different distributions and evaluated whether judgments were influenced by stimulus context. All participants reproduced the presented length differently depending on the context: The same stimulus was reproduced as shorter, when on average stimuli were short, and as longer, when on average stimuli were long. Interestingly, the relative importance given to the current sensory signal and to priors was almost constant during childhood. This strategy, which in adults is optimal in Bayesian terms, is apparently successful in holding the sensory noise at bay even during development. Hence, the influence of previous knowledge on perception is present already in young children, suggesting that context-dependency is established early in the developing brain.
Development of context-dependency in human space perception

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