Title: Veridical and consciously perceived location compete for visuomotor control

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Abstract:

An influential proposal holds that our visual systems use different information for perception and action. Though numerous studies utilized visual illusions, in which veridical and perceptual properties of objects differ, the evidence was inconclusive and no consensus was reached. In response priming, some evidence suggests that only physical attributes of the prime stimuli control motor responses. Across three experiments, we examined the contributions of physical and consciously perceived location to response priming, using a well-known flash-lag illusion, in which a briefly flashed disk and the moving bars appearing at the same location are perceived as displaced. In all experiments, participants made speeded responses to the location of the target disk presented above or below the static bars. In the first experiment we kept the physical location of the prime disk constant, the disk and moving bars were presented at the same location. Responses to the target disk were consistently biased by the prime disk, demonstrating that rapid motor responses were primed by the illusory perception of the prime location. In the second experiment, we inverted the physical and perceived location of the prime. We estimated the size of illusion for each participant and then presented the prime disk either above or below the moving bars, so that perceived location was in alignment with the moving bars. Motor responses were moderated by the physical location of the disk, showing that visuomotor system used veridical prime location. In the third experiment, we pitted physical and perceived location against each other so that physical and perceived location of the prime were on the opposite sides of the moving bars. With this setup, motor responses were not influenced by primes. Our experiments demonstrate that our visuomotor systems use both sources of information, veridical as well as consciously perceived location to guide behavior.