Motion Aftereffects Transfer between Touch and Vision

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Summary

• Question: Bidirectional relationship between visual and tactile motion processing?
• Approach: Transfer of motion aftereffects
• **Visual motion aftereffect**: Adapting to visual motion in one direction causes a subsequently presented stationary stimulus to be perceived as moving in the opposite direction
• Result:
  – Repeated exposure to visual motion in a given direction produced a tactile motion aftereffect
  – Repeated exposure to tactile motion induces a visual motion aftereffect
• Implication: The processing of visual and tactile motion rely on shared representations that dynamically impact modality-specific perception
Experiment 1: Vision to Touch

- Point of subjective equality (PSE): sufficient upward nulling motion makes the tactile stimulus perceived equally “upward” and “downward”
- Measure of aftereffect: difference in PSE upward versus downward – significant in experiment 1
  - supporting crossmodal impact of visual motion stimulation on tactile motion discrimination
Experiment 1: Vision to Touch

- Tactile motion aftereffect
  - reliable within observers
  - stronger after downward visual motion adaptation (than after upward visual motion adaptation)
Experiment 2: Touch to Vision

- Pilot studies were conducted to ensure that tactile motion aftereffects could be reliably induced with the adapting parameters.
Experiment 2: Touch to Vision

- All observers showed a bias to perceive downward visual stimulus
- Nonetheless, motion aftereffects are present relative to this bias within visual motion perception
Implications

- Perceptual experience of one modality can be influenced by a previously presented stimulus in another modality
- At some point in the motion processing streams, these two modalities have partially overlapping substrates
- Some shared representations between touch and vision are directionally specific
- Bidirectional crossmodal interactions may be more prevalent than currently believed
- Implications for Neural Architecture
- Implications for Multisensory Integration