We addressed this question by testing biological motion perception of individuals with early onset profound visual deprivation, before treatment with sight-restoring surgery and immediately following it.

Enhanced sensitivity to biological motion appears early in human development and is found even in newly hatched chicks, reared and hatchled in darkness. According to studies with sight-restored subjects tested years after recovery from congenital blindness, this ability and its neurophysiological signatures are resilient to visual deprivation and spared even after long periods of blindness. This has led to questioning if visual experience is at all required for development of visual systems for specialized processing of biological motion.

Enhanced sensitivity to biological motion appears early in human development and is found even in newly hatched chicks, reared and hatchled in darkness. According to studies with sight-restored subjects tested years after recovery from congenital blindness, this ability and its neurophysiological signatures are resilient to visual deprivation and spared even after long periods of blindness. This has led to questioning if visual experience is at all required for development of visual systems for specialized processing of biological motion.

Visual motion processing system does not rely on early visual input. Global motion after early visual deprivation. (Cortex, Volume 71, Pages 359-377)

Biological motion perception can develop in the absence of early visual input. No correlation between time-point: Visual acuity at the time of testing (see plot).

Performance on the two tasks correlated, at each testing time-point:
- With visual acuity at the time of testing (see plot).
- With pre-treatment visual acuity.

This correlation persisted up to a few months post surgery (up to 2 for walking direction and 6 for biological motion discrimination).

No such correlation in controls (p=0.12, 0.82)
No correlation between performance in Experiment 1 and 2.

What can differences in performance between the tasks be attributed to?

What is the neural underpinning of differences in performance between individuals?

What types of information were used by subjects to perform discrimination of walking direction?

What is the neural underpinning of differences in performance between individuals?

What can differences in performance between the tasks be attributed to?

Biological motion perception can develop in the absence of early visual input.

Visual experience plays a significant role in the emergence of this skill.

Follow-up Questions

References