Blink different! Blink rate reflects individual differences in directed exploration

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Summary

Previous work has suggested that humans use two strategies in exploit-explore dilemma: directed exploration & random exploration. [Wilson et al. 2014]

In this work we show that spontaneous blink rate correlates with directed exploration, but not with random exploration.

The Horizon Task

Choose between slot machines to maximize reward. Four example plays are shown before first choice. This precisely controls information subjects have before making a choice.

Task conditions & behavior

Both directed ($p = 3.68 \times 10^{-5}$) and random ($p = 6.57 \times 10^{-4}$) exploration increase with horizon.

Gaze & blinks over the course of the game

Pupil correlates with random exploration?

Blink rate correlates with directed exploration

When does BR correlate with directed exploration?

Replication of blink effect

Choose between slot machines to maximize reward. Four example plays are shown before first choice. This precisely controls information subjects have before making a choice.

Blink rate correlates with directed exploration

Pupil correlates with random exploration?