Factors influencing optimal skill learning: data from an online game

Tom Stafford, University of Sheffield
Network on Intrapersonal Research in Education
York, 16th March 2016

Intrinsic motivation and the discovery of novel actions
- where do new skills come from?
- study of intelligent movement to reveal principles of intelligence generally


How to learn: Spaced vs blocked practice


Rats and humans refine their movements over multiple trials


Example player data for people who played more than 15 times

**Practice: amount**

- Plot 1: Score vs. Attempt number
- Plot 2: Average score vs. Attempt number
- Plot 3: Cumulative distribution of scores

n=854064
The “Ten Thousand Hours Rule”


Practice: spacing
Progress!

Using games: allow large n + all actions taken during learning recorded

We confirm previous findings on skill acquisition:
- power law of practice
- practice spacing

We extend these findings
- qualification of the 10,000 hours "rule"
- weighting factors against each other
- "Parametric analysis" : shows functional form
Chess!

Games as research tools

Not just power...

...Parameterisation

...Whole task analysis

...Intrinsically motivated performance (in the future)

...Adaptive experiment design

t.stafford@sheffield.ac.uk
@tomstafford
http://www.tomstafford.staff.shef.ac.uk/