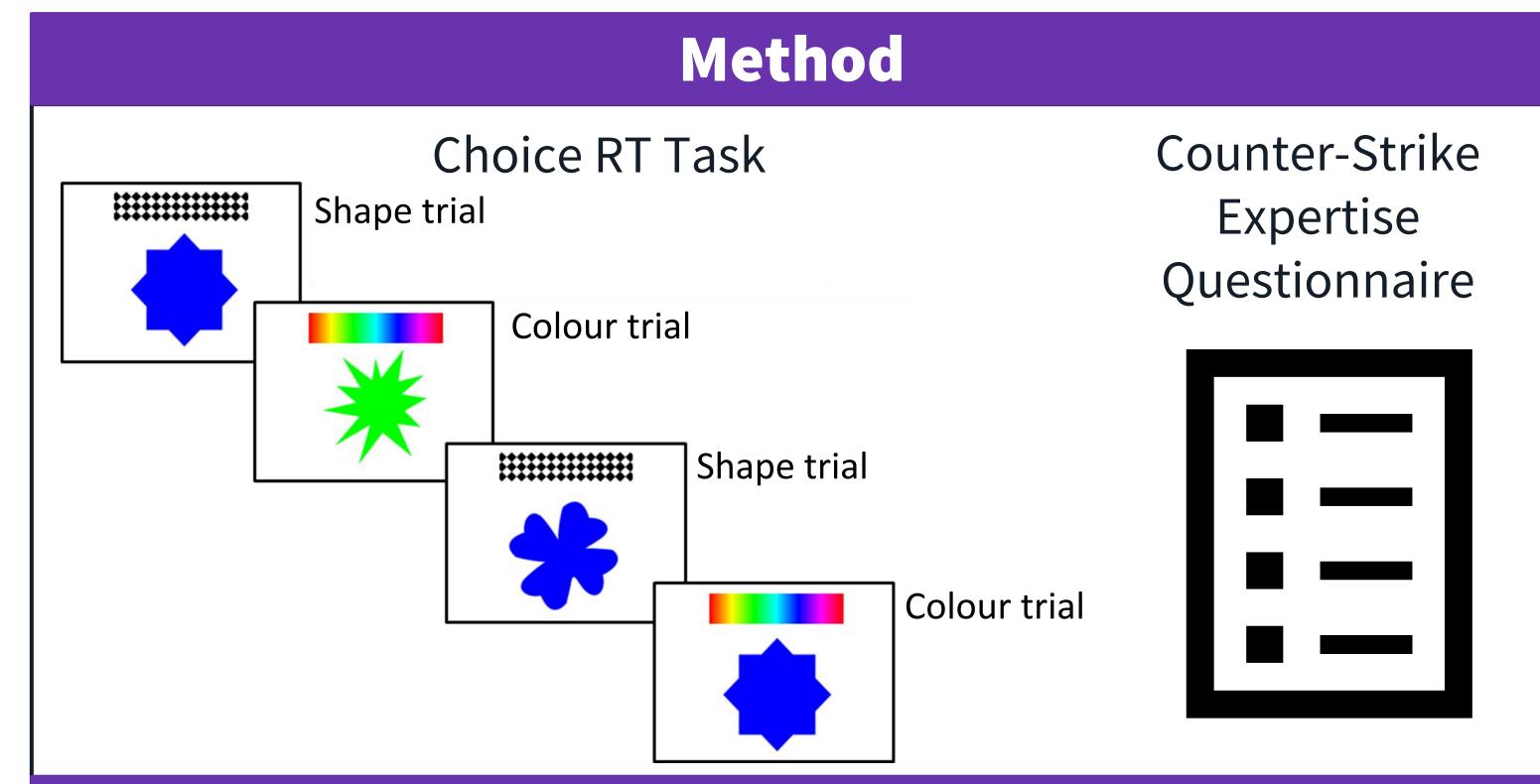
Processing Speed and Multitasking Performance in First-Person Shooter Players: A Drift-Diffusion Model Approach University of A Drift-Diffusion Model Approach Sheffield Eleanor R. A. Hyde, Robert Schmidt, Daniel J. Carroll, & Claudia C. von Bastian

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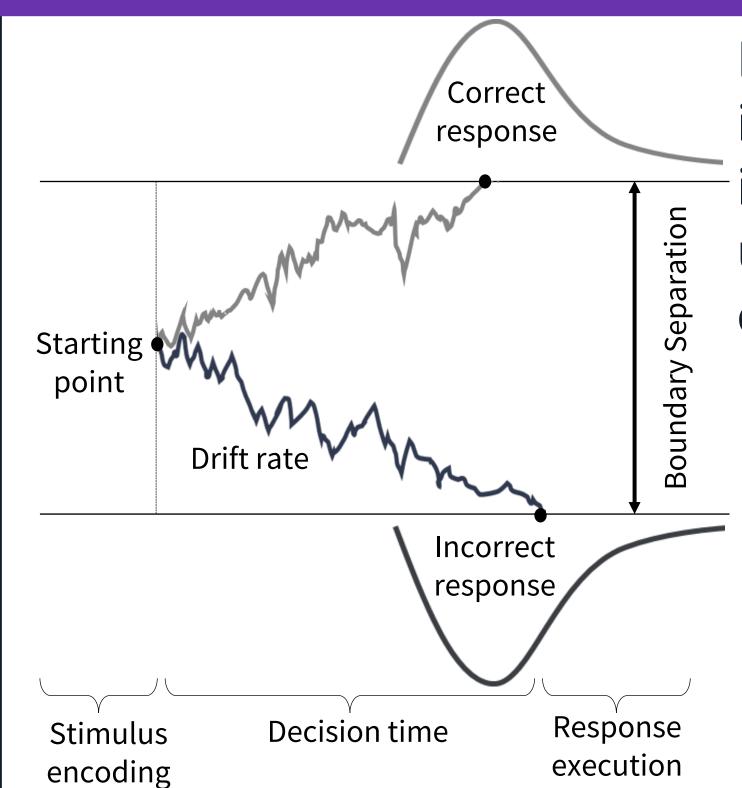
Background

- Video games provide a unique sandbox for studying cognition, with fast-paced First-person Shooter (FPS) games, like Counter-Strike, posing significant cognitive challenges.
- Prior research links FPS play to better multitasking but often confounds it with processing speed using absolute reaction times (RT).
- Studies have also used small samples of novice players, limited expertise measures, and mix video game genres.
- This research assesses multitasking and processing speed in diversely experienced Counter-Strike players.

Participants N = 230playtime **Total hours** Weekly hours playtime Weekly hours playtime Novice n = 77 Experienced n = 98 Aspiring n = 21 Semi/Professional n = 34

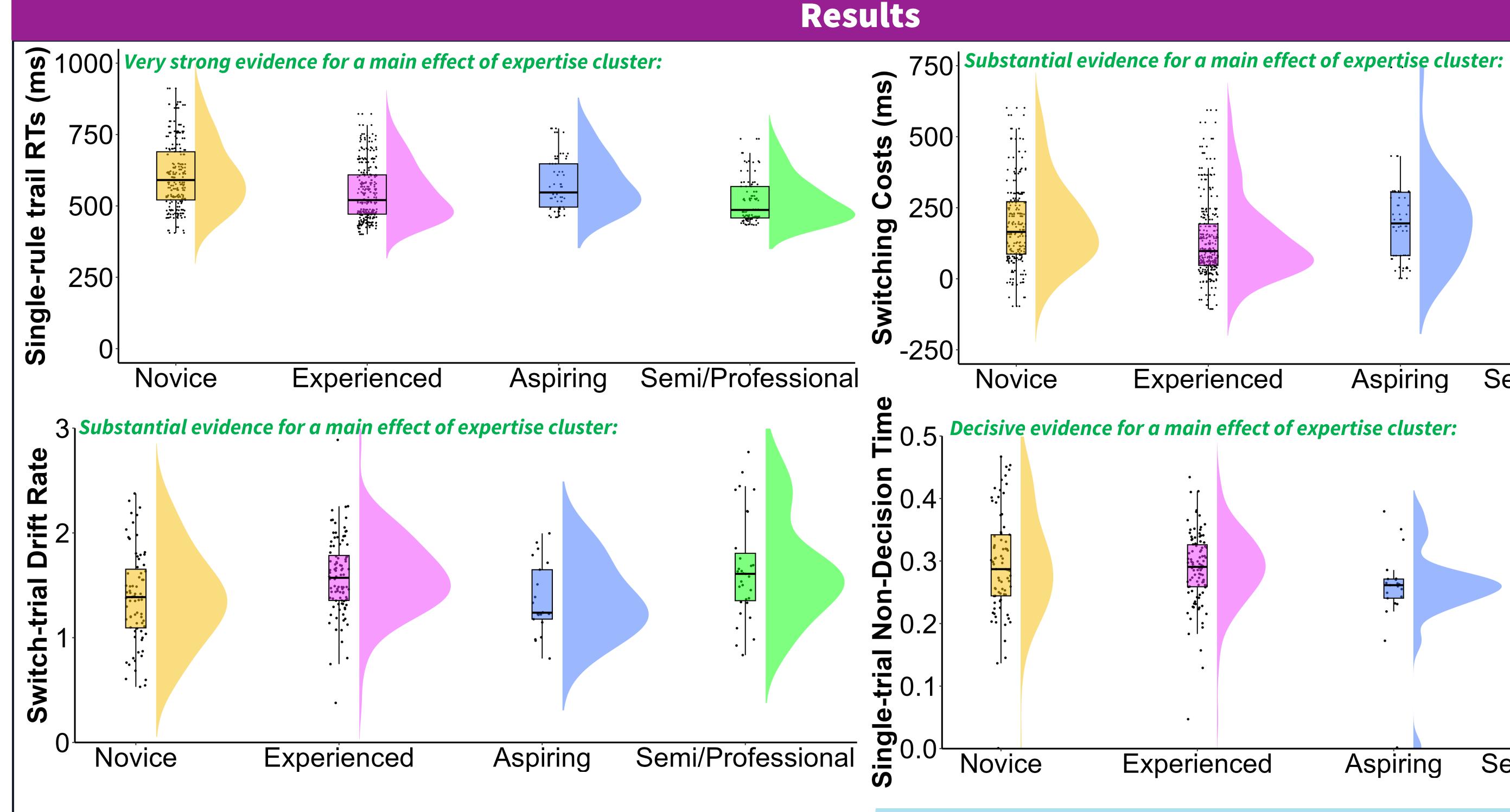


The Drift-Diffusion Model



Decomposes RTs and accuracies into distinct components to give insight into cognitive mechanisms underlying performance differences in decision making.

- Drift Rate (v): evidence accumulation.
- **Boundary Separation (a):** response caution.
- Non-decision time (t0): stimuli encoding and response execution.



Aspiring Experienced Semi/Professional Novice Decisive evidence for a main effect of expertise cluster:

Semi/Professional players showed:

- Faster processing speed (RTs) in single-rule trials without sacrificing accuracy.
- Greater information accumulation efficiency in challenging switch trials, shown by higher drift rates (v)
- Faster encoding and response execution in simpler singlerule trials, shown by shorter non-decision times (t0).

Experienced players showed:

More efficient switching between tasks, shown by lower switching costs compared to more expert players.

Conclusion

Aspiring

Semi/Professional

FPS expertise is a complex and non-linear construct, measurable through readily available objective metrics.

Experienced

- FPS expertise relates to faster stimuli encoding and response execution in simple decision-making trials, and evidence accumulation in more complex decision-making trials.
- Expert FPS players have an advantage in rapid decisionmaking in fast-paced environments, compared to Novices.
- Future research could examine real-time decision-making processes during controlled Counter-Strike gameplay.