

Driven by risk: Understanding reference-dependent preferences using simulated auto racing

How does risk-taking change near promotion or relegation?

Reference-dependent preferences describe decisions evaluated against a meaningful benchmark rather than final outcomes alone. James Hilliard and coauthors study this behavior in the online auto racing simulation software iRacing, where finishing performance affects iRating, a competitive ranking, while incident avoidance determines safety ratings and license progression.

The researchers analyzed 764,804 driver-race results from 34,565 racers across 55,985 races in the Skip Barber series. Car models and tracks rotated on a weekly basis; all racers used the same car on the same track within a week of the series. Regression models used incident points per corner as a proxy for risk-taking, accounting for driver skill, safety scores and race conditions.

Racers near promotion generally recorded fewer incidents per corner, while those near relegation recorded more. Higher-license racers facing relegation took less risk, consistent with protecting their status. Final-week risk-taking rose overall, but less so near relegation. Estimated loss aversion was 2.15: potential losses weighed about twice as much as gains. Greater in-game investment was associated with more risk-taking.

The findings suggest that promotion thresholds and season-end rules can influence risk-taking even without prize money. Designers of competitive systems should consider these responses when balancing safety and performance.*

*Because participants were self-selected amateur racers and incidents only approximate risk-taking, the results should not be treated as universal predictions for other settings.

MAJOR TAKEAWAYS:

- Racers near promotion generally took less risk; those near relegation took more.
- Higher-license racers facing relegation tended to take less risk, consistent with protecting existing status.
- Final-week risk-taking increased overall, but the increase was smaller among racers near relegation.

WHO NEEDS TO KNOW:

- Competitive platform designers
- Esports managers and league organizers
- Behavioral economics researchers
- Managers designing performance incentives

CONTACT US:

- **James Hilliard**
james.hilliard@temple.edu
- Fox School of Business, Temple University
- Journal of Risk and Insurance (2026)
- [Read the article: 10.1111/jori.70047](https://doi.org/10.1111/jori.70047)