

# The impact of exposure to different formats of Cricket on the performance of a Test Batter



*R.M. Silva (main author)*<sup>1</sup>, *D.Y. Jayasinghe (presenter)*<sup>2</sup>, *L.H.K.P. De Silva*<sup>3</sup>, *C.L. Jayasinghe*<sup>1</sup>

<sup>1</sup> Department of Statistics, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka

<sup>2</sup> Department of Mathematics, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka

<sup>3</sup> Faculty of Graduate Studies, University of Sri Jayewardenepura, Sri Lanka

**Abbreviated abstract:** The impact of exposure to different formats of cricket on survival and scoring ability in Test innings is investigated. Player performance was measured using BA, SR and ATH. Batters with greater exposure to Test and ODI but lower exposure to T20 have lower Test SR (striking power) but higher ATH (survival ability). Players with relatively lower exposure to Test and ODI but higher exposure to T20 have lower BA, have highly varied SR and ATH.

## Related publication(s):

RM Silva *et al*, Tactics for Twenty20 cricket, South African Statistical Journal 50 (2), 261-271 (2016)



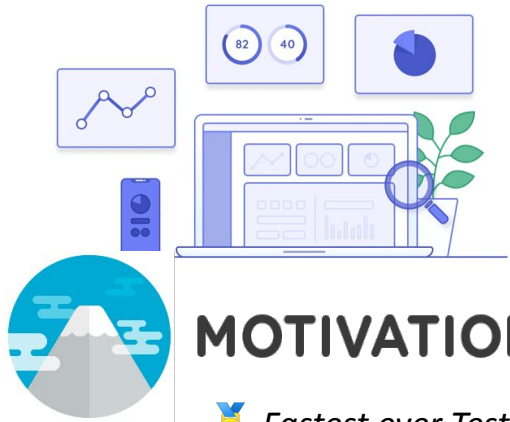
There are three formats in the game of cricket (e.g. see Silva et al (2016) for a discussion):

- Test (unlimited balls, introduced in 1877)
- ODI (limited balls, introduced in 1971)
- T20 (very limited balls, introduced in 2003)

Despite the possibility of facing an unlimited number of balls it has been observed in a modern test game, batters struggle to stay at the crease. Newer batters seem to adopt a more dynamic batting style even in a Test inning and some often tend to get dismissed sooner than well-seasoned batters.

In this study we attempt to investigate the impact of exposure to different formats of cricket on Test cricket performance using three performance measures: Test BA, Test SR and Test ATH.

Data source was the ESPN Cricinfo website ([www.espncricinfo.com](http://www.espncricinfo.com)) and ball by ball data were extracted through a program written in R software (R Core Team, 2020).



# Impact of exposure to Test, ODI, and T20 on Test performance (ability to score/survive)



## MOTIVATION

- 🏆 *Fastest ever Test century: 54 balls*
- 🏆 *Most sixes in Test history: 107*
- 🏆 *Highest score by a Blackcaps Test batter: 302*

And that's just his Test career 🙌

Happy birthday to New Zealand great, Brendon McCullum 🎂

Source:

<https://www.facebook.com/146078378744600/posts/4923314274354296/?d=n> on 27th October 2021



**Abbreviated Names of Batters** 

# Glossary



## Steps include:

1. Scraping data from ESPN Cricinfo website and cleaning for analysis under each player category (A,B and C).
2. Compute ATH, SR and BA of each player.
3. Construct the scatter diagrams to identify any relationship /impact of exposure to test, ODI and T20 types with test performance measures.
4. Conduct a hypothesis testing to further verify the observations based on the descriptive study to test the statistical significance in order to draw conclusions.

Result	Test	H1	p-value
1	Mann-Whitney	Greater exposure to Test means > 200 Test innings : A vs B and C	0.0449
2	Mann-Whitney	Greater exposure to Test means > 100 Test innings : A and B vs C	0.0172
3	F test	Variance of SR is significantly less : A+B < C	0.036
4	Mann-Whitney	Greater exposure means >150 ODI Innings	0.0582
5	Mann-Whitney	Greater exposure means >200 ODI Innings	0.0222
6	Mann-Whitney	Greater exposure to Test means > 200 Test innings : A vs B and C	0.0213
		Greater exposure to Test means > 100 Test innings : A and B vs C	0.0005
7	Mann-Whitney	Median number of T20 innings of A < Median number of T20 innings of B+C	0.0111
8	F test	Variance of ATH of category A+B players < variance of category C players	0.101

### Test SR (Strike Rate)

SR is a measure of how quickly a batter achieves the primary goal of batting; i.e. scoring runs. It is mathematically equal to the ratio of runs scored and balls faced times 100. It gives us an indication of the ability to score runs of a batter.

### Test BA (Batting Average)

BA can be defined as the average number of runs scored by a batsman before he gets dismissed every time he comes out to bat for his team. It is the ratio of total number of runs the batters have scored to the number of times they have been dismissed.

*BA disregards instances where the batter managed to stay un-dismissed. Hence, we employ survival analysis to come up with a novel measure that can effectively manage the not-out scores. The new measure proposed can be used to evaluate the ability of a batter to survive the ball in a test inning effectively.*

### Test ATH (Average Total Hazard)

TH is defined based on ball-wise survival r.v.: *the runs scored by the batter for the  $i$ th ball while surviving the  $i$ th ball in a test inning for a certain batter.* TH is the accumulation of hazard of survival of the  $i$ th ball. ATH represents average of TH in a test inning for that batter. Will be used for comparisons.

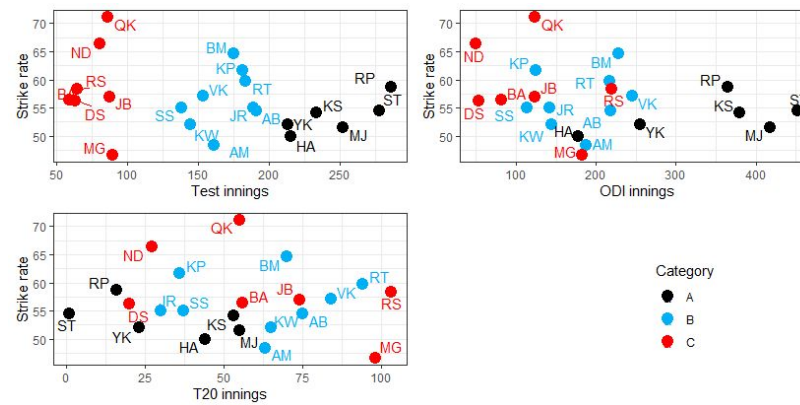
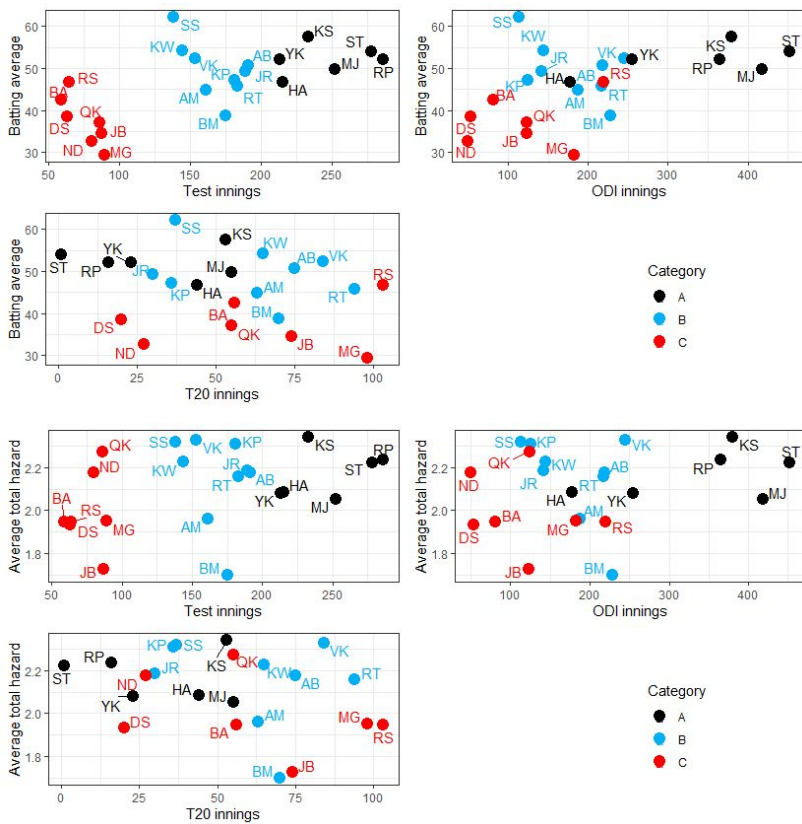
### Player Categories

**A:** Batters who have exposed to more than 200 test innings

**B:** Batters who have exposed to 100 - 200 test innings

**C:** Batters who have exposed to 50 - 100 test innings





Data: Exposure to ODI: highest among A, not very dissimilar among B and C. Exposure to T20: relatively lower among A than among B and C.

## Key take-home messages

- Test SR is lower but Test BA, Test ATH is higher among those with greater exposure to Test. **From Result 1, Result 2, Result 6 (0.05 significance level)**
- Test SR is lower but Test BA is higher among those with greater exposure to ODI. **From Result 4 (0.1 significance level) and Result 5 (0.05 significance level)** It was interesting to observe that those who have had most exposure to Test have had very low exposure to T20. **From Result 7 (0.05 significance level)**
- Among those who are less exposed to Test cricket the survival ability (measured using ATH) is uncertain (very varied). **From Result 8**
- Test SR (ability to score) is very much varied among C (with less exposure to test). **From Result 3 (0.05 significance level)**
- Category B players had moderate exposure to all three formats of cricket and they have considerably high Test ATH and moderately high Test BA and Test SR.

