

# CLUB BULLETIN

Harpenden Racqueteers Newsletter

March 2020

## Match tactics for captains

**Does it make a difference if players are not played in order of strength in a mens or ladies 4?**

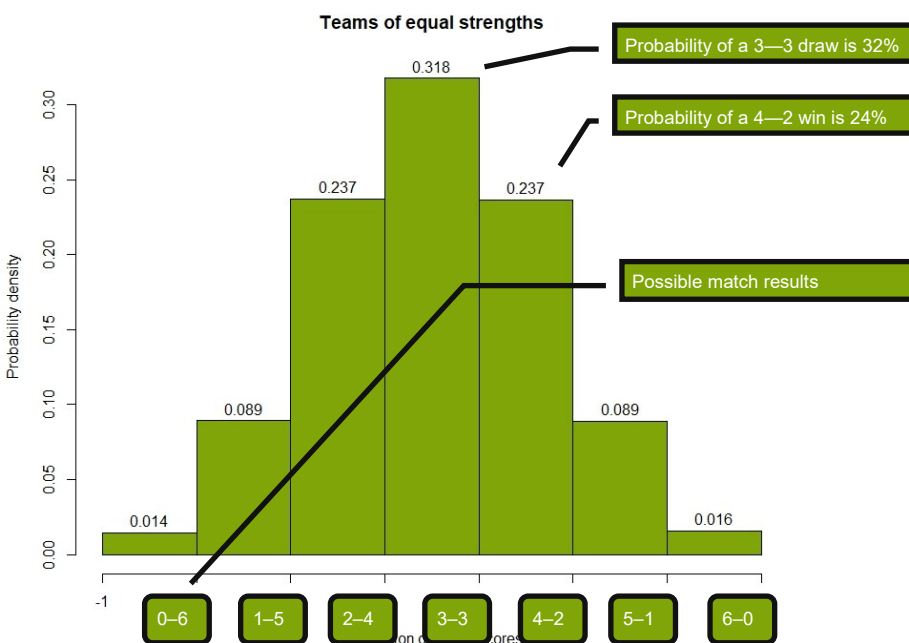
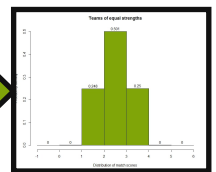
Wonder, no longer. Sophisticated modelling techniques now demonstrate what you may have intuitively suspected. Switching the order of players' strengths increases the chances of a match resulting in a draw. So if you believe your team is the weaker team, it pays to break with convention! If, as the season closes, you only need a draw and would rather not risk losing even if there is more chance of winning, then break with convention.

### Analysis

The diagrams below and on the following page show the results of simulating a large number of mens or ladies 4 matches. Each player is given a 'strength' rating and the first team plays them in order of strength, player 1 being the strongest. The other team can choose to do the same or try different tactics. The results show the distribution of overall match scores. The bar on the histogram to the left of "3" represents a draw (3—3). The bar to the left of "1" represents a score of (1—5) — a loss to the first team and a win for the second. The height of each bar represents the probability of each possible score being the overall result. Given that there is a degree of luck in each match, there is a small probability that the weakest team can win or at least draw. Let's start with teams are of equal strength and both play their strongest player in position 1.

*Have you ever wondered whether it makes a difference if you play your players out of order? If so, what difference? Should you feel aggrieved if the opposition play their strongest player in position "4" contrary to convention?*

Turn to the next page to see players switched

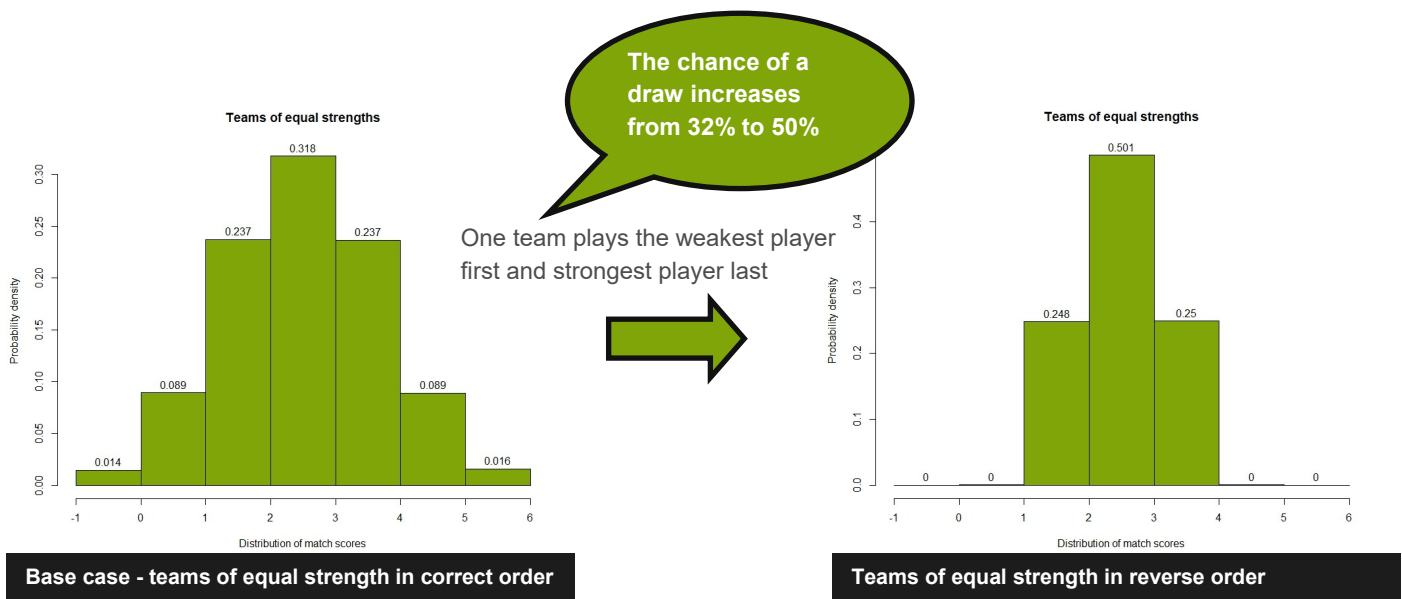


### In this issue

- Tactics for team captains
- Follow along to learn new programming skills in "R"
- Recommendations for badminton viewing whilst not playing
- How to train at home

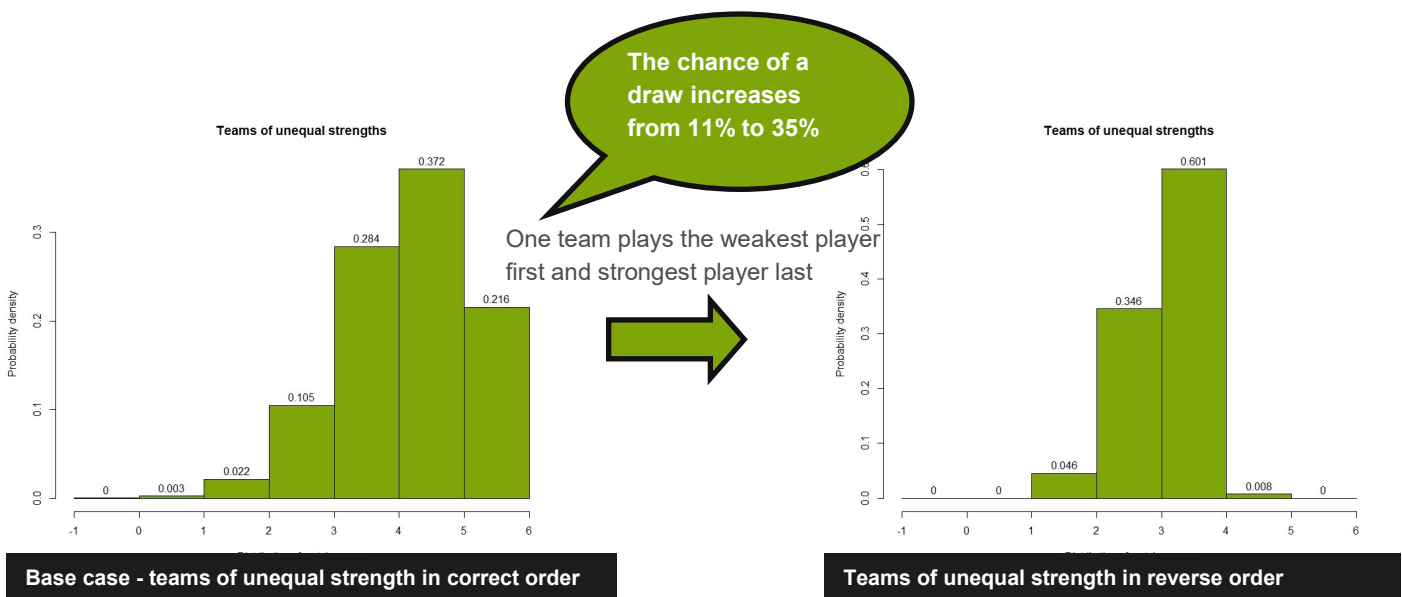
The base case — both teams are equally strong and play in the 'correct' order

# The results...



## What if one team is stronger than the other?

Much more commonly, one team will be stronger than the other. Take the case where every player on one team is stronger than their corresponding player on the other team. What should you do if you suspect you are the weaker side? In this example reversing the order of play increases the chance of a draw from 11% to 35% and, even better, **the chance that the weaker team unexpectedly wins doubles** (well, only from 2% to 4%, but there's hope)!



## What do the rules say?

Clearly league organisers consider it important for team captains not to fiddle with the order of players tactically since Rule 23 of the Southwest Herts Badminton League requires captains to 'exchange' — implying simultaneity — the names of their players. However, there is no constraint in the rules concerning the order chosen. And, in any event, any judgement as to the relative strength of players would be subjective at local league level (unlike for professional players playing in World Badminton Federation ranking tournaments). So any such rules would be unenforceable. Nonetheless it is an unspoken convention to play players in order of strength.

**Match result sheets**

23. Team captains will exchange names of players before the first rubber of any match commences and no alterations shall be made thereafter except with the agreement of the opposing captain. A player's surname must be entered as registered on the Badminton...

Extract from SWHBL rules



## Want some on-line coaching?

Recommended websites on the internet are:

### THE **Badminton Bible**

[Badminton Bible](#)

Very clear and well reasoned advice and information prepared by Mike Hopley - a level 2 coach.

[Coaching badminton](#)



Lee Jay Bok - former Korean international player and coach offers a comprehensive YouTube channel .

[Badminton Family](#)



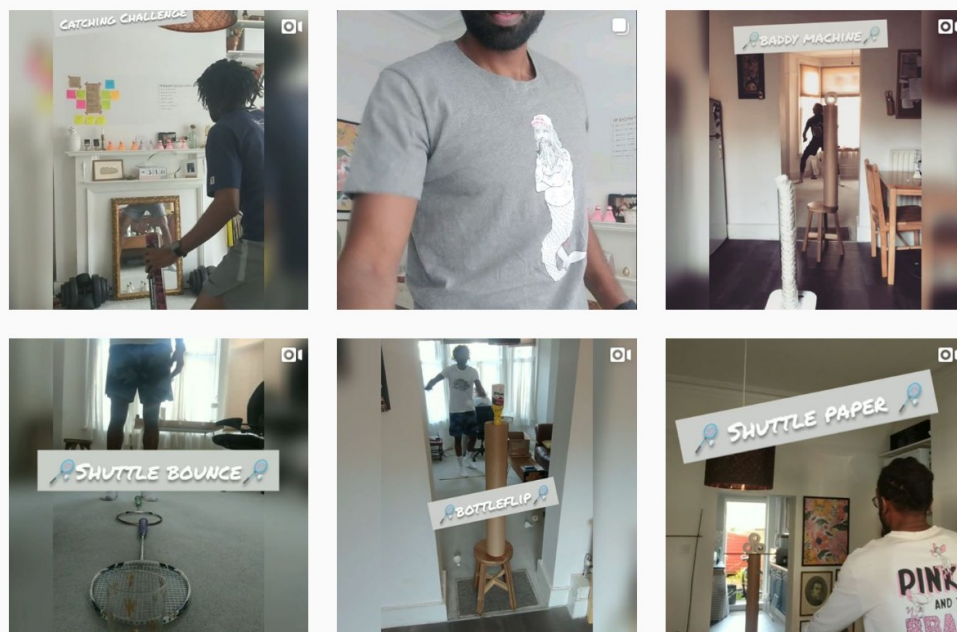
Rasmus Tran, Thomas Laybourn and other Danish professional badminton players and coaches offer advice, vlogs and training courses.

## Coming soon...

- Peg boards — who needs them? Real wooden pegs, websites, new Apps under development
- Reaction from South-west Herts Badminton

Instagram

Search

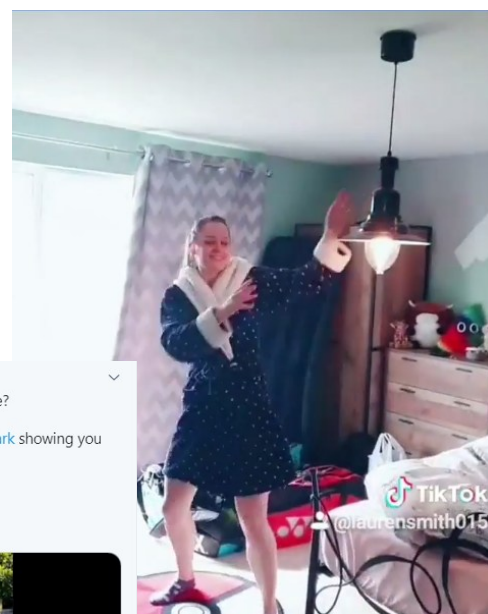


Badminton challenges to try at home (follow [@badmintonnews1](#) on Instagram)

## How to train at home

Ever wondered what to do with those surplus rolls of toilet paper? Stack them up and see how many shuttles you can serve into the holes (bottom right picture above). [@badmintonnews1](#) on Instagram has daily challenges to keep you entertained.

Alternatively follow how our Badminton England stars are keeping busy at home with the crazy antics of [@laurensmith015](#) posted on TikTok.



Badminton England's twitter feed includes coach Anthony Clark's ([@anthonyianclark](#)) idea for home wrist training

# For the geeks

Below is the code used. For those unfamiliar with R, it is a free software environment for statistical computing and graphics.

```

1 # DEFINE TEAMS AND STRENGTHS ----
2
3 # playernumber is the position the player plays in
4 # playerstrength is how strong a player is between 1 and 10 (10 being strongest)
5 playernumber <- c(1,2,3,4)
6 playerstrength <- c(2,4,6,8)
7 TeamA <- data.frame(playernumber = playernumber, playerstrength = playerstrength)
8
9 playernumber <- c(1,2,3,4)
10 playerstrength <- c(8,6,4,2)
11 TeamB <- data.frame(playernumber = playernumber, playerstrength = playerstrength)
12
13 # define the standard deviation used to adjust the probability of a game being won
14 sd <- 1
15
16 # DEFINE FUNCTION FOR PLAYING ONE GAME ----
17
18 # p1 <- 1 player numbers
19 game <- function(p1, p2, p3, p4){
20   A <- 0 #initial score of team A
21   B <- 0 #initial score of team B
22   #compare team strengths
23   s1 <- TeamA[p1,2]
24   s2 <- TeamA[p2,2]
25   s3 <- TeamB[p1,2]
26   s4 <- TeamB[p2,2]
27   Difference <- (s1 + s2 - s3 - s4) / 2
28   Luck <- rnorm(1,mean = Difference,sd = sd)
29   if (Luck > 0) {
30     A <- A + 1
31   }
32   else
33     B <- B + 1
34   result <- c(A,B)
35   return(result)
36 }
37
38 # DEFINE FUNCTION FOR PLAYING ONE MATCH ----
39
40 match <- function (p1, p2, p3, p4){
41   #play first game
42   game1 <- game(p1, p2, p3, p4)
43   #play second game
44   game2 <- game1 + game(p1, p2, p3, p4)
45   if(max(game2) == 2){
46     if(game2[1] == 2){
47       game2 <- c(game2,1,0)
48     }
49     else game2 <- c(game2,0,1)
50     return(game2)
51   }
52   #play third game
53   game3 <- game2 + game(p1, p2, p3, p4)
54   if(game3[1] == 2){
55     game3 <- c(game3,1,0)
56   }
57   else game3 <- c(game3,0,1)
58   return(game3)
59 }
60
61 # DEFINE OVERALL MENS OR LADIES 4 MATCH ----
62 overallmatch <- function(TeamA, TeamB){
63   #play six matches
64   pair1 <- match(1,2,1,2)
65   pair2 <- match(1,3,1,3)
66   pair3 <- match(1,4,1,4)
67   pair4 <- match(2,3,2,3)
68   pair5 <- match(2,4,2,4)
69   pair6 <- match(3,4,3,4)
70   scoresheet <- data.frame(pair1, pair2, pair3, pair4, pair5, pair6)
71   scoresheet
72 }
73
74 # OVERALL MATCH RESULT SUBMITTED
75
76 winners <- NULL
77 submission <- overallmatch(TeamA, TeamB)
78 a <- sum(submission[,3])
79 b <- sum(submission[,4])
80 score <- c(a,b)
81 winners <- cbind(winners, score)
82
83 # SIMULATE MANY MATCHES AND AGGREGATE RESULTS ----
84
85 winners <- NULL
86 for(i in 1:10000){
87   submission <- overallmatch(TeamA, TeamB)
88   a <- sum(submission[,3])
89   b <- sum(submission[,4])
90   score <- c(a,b)
91   winners <- rbind(winners, score)
92 }
93
94 # PLOT HISTOGRAM OF RESULTS ----
95 hist(winners[,1], breaks = c(-1,0,1,2,3,4,5,6), freq = FALSE, col = "lightblue",
96     labels = TRUE, main = "Teams of equal strengths", xlab = "Distribution of match scores",
97     ylab = "Probability density")
98

```

The program runs simulations of 10,000 badminton matches in Mens-4 or Ladies-4 format.

Each team's players are given a relative strength rating of between 1 and 10.

In the examples given on page 2 of this newsletter, the 'equal strength' teams had players with strengths as follows:

Player position	Team A strength	Team B strength
1	8	8
2	6	6
3	4	4
4	2	2

And then the order of Team B's players was reversed:

Player position	Team A strength	Team B strength
1	8	2
2	6	4
3	4	6
4	2	8

Next, every player in Team A was made slightly stronger:

Player position	Team A strength	Team B strength
1	8.5	8
2	6.5	6
3	4.5	4
4	2.5	2

And again Team B reversed:

Player position	Team A strength	Team B strength
1	8.5	2
2	6.5	4
3	4.5	6
4	2.5	8

# Want to get involved?

Use your unexpected free time to submit articles for next month's edition.

Suggestions for improvements welcome.

Ideas to submit to the social secretary when the club resumes and social distancing policies are lifted?

## Contact Us

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