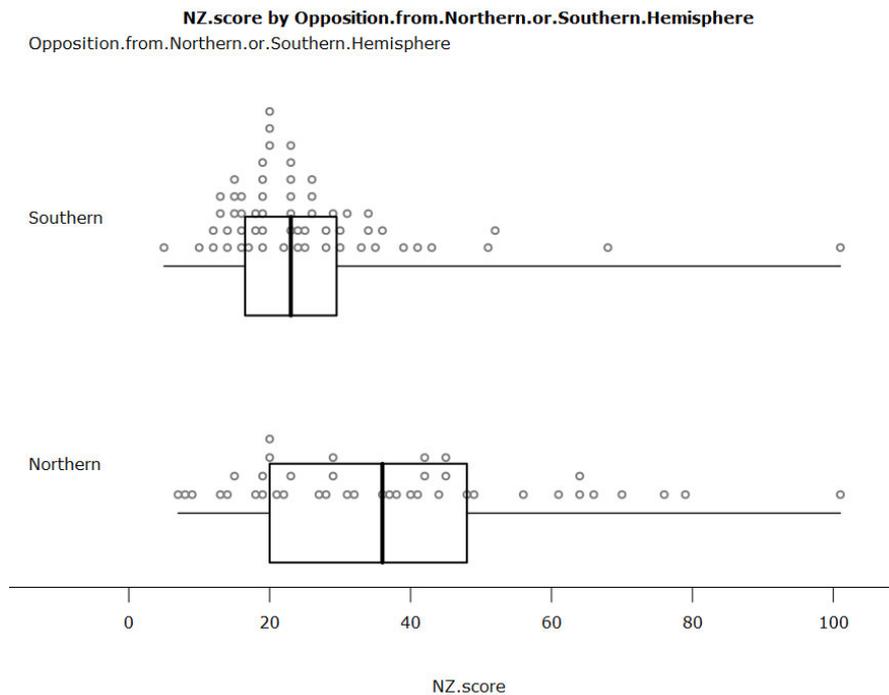


I wonder if the All Blacks tended to score more points in test matches against Northern than Southern Hemisphere teams between 1992 and 2011? I am going to look at a random sample of 100 data points taken from all test matches, 1992 to 2011. I think the All Blacks score is likely to be bigger against Northern Hemisphere teams than Southern hemisphere teams because they always seem to score lots of points on overseas tours but the southern hemisphere Four Nation matches seem a lot closer when I watch them on Sky Sports. Because the matches are usually closer, the points scored are not high very often.

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This table gives a summary of the numbers I have used when describing the graphs

Summary of NZ.score by Opposition.from.Northern.or.Southern.Hemisphere								
	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	Std.dev	Sample.Size
Northern	7	20.0	36	37.76	48.0	101	21.766	41
Southern	5	16.5	23	25.56	29.5	101	14.950	59

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The graph shows that for this sample the average All Blacks score against Northern Hemisphere teams was bigger than against Southern hemisphere teams. Looking at the graph this is because the median for matches against northern teams is about 35 points whilst the median against southern teams is about 24 points (shown by the thick black lines on the graph). This agrees with my initial thoughts that they always score more against Northern Hemisphere teams

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The middle 50% of All Blacks scores against Northern hemisphere are much more spread out than against Southern hemisphere teams. I can see this because the box on the graph

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(the middle 50%, the inter-quartile range) is much larger for the northern games than the southern games. The width of these boxes are 28 points for northern games and 13 points for southern games. I think this is because most of the matches against the southern hemisphere teams are against Australia and South Africa and the teams are quite equal in strength, whilst the Northern hemisphere teams vary quite widely. For example, Italy are very weak.

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There is quite an overlap in the boxes. The left hand box of the north (from 20 to 36 points) contains almost all the box of the south (16 to 23 points). This shows there are a lot of middle points scores in common for both hemispheres.

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Both graphs have a long right tail with a few games with a much larger score than the others. In both cases the biggest score is 101 points. There are fewer of these very big points on the southern graph (the last 2 points) than the northern graph (the last four points). These very large scores are likely to have come from playing the weaker teams, for example one of the island teams in the southern hemisphere and Italy in the northern hemisphere. I looked this up on the All Blacks website and this game was against Italy during the 1999 world cup.

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The scores against the southern hemisphere are very tightly bunched together at the lower end of the graph. This shown by the clump of points between 5 and 40 points with tall columns around 20 points. The tall columns mean there must have been several matches when the All Blacks scored the same number of points. There is not the same shape in the northern hemisphere graph, where the points are much more evenly spread out between 7 and 55 points.

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The median is given in the table, The interquartile range is the 3rd Qu – the 1st Qu., 28 for the northern hemisphere and 13 for the southern hemisphere, this is the width of the middle 50%. The table shows that I only looked at 41 games against northern hemisphere teams and 59 against southern hemisphere teams. I don't think this matters as it reflects the fact that the All Blacks do play more games against southern hemisphere teams than the northern hemisphere teams. The smallest points (7 and 5) and the largest points (101 and 101) are very similar in both hemispheres.

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Conclusion

I want to make a conclusion about what happens in all the test matches the All Blacks played from 1992 to 2011. Because the sample sizes are close to 50 I have to use the DBM/OVS rule. The DBM is 13 and the OVS is 31.5. The ratio is $13/31.5 = 0.41$. The critical ratio for sample sizes around 30 is $1/3$ and this will be bigger than the critical ratio for my sample sizes, because my samples are bigger. Because the DBM/OVS ratio for my samples is bigger than the critical ratio for sample sizes of 30 it must be bigger than the critical ratio for sample sizes around 50. I can conclude that for the test matches between 1992 and 2011 the All Blacks are likely to score more points against northern teams than southern teams.

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I am reasonably confident about this call but I might get a different answer if I took another sample. Another sample would have different data points and would produce different graphs that could lead me to a different answer, although I think this is very unlikely. It is unlikely because of the big shift between the medians in my samples and the high value of the DBM/OVS ratio.

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