Guide to BSS Selection Profile Graphs

Introduction

The BSS selection profile graphs are intended to bring a high degree of objectivity in measuring performances across age groups, across disciplines and across genders. We are all feeling a shared achievement towards that elusive goal of world level podium performances is undermined if subjective opinions can take hold pitching one athlete against another.

The BSS selection graphs build on the analysis and data gathering that has been benchmarking athlete progress for the past decade in British skiing under the old SnowsportGB and has evolved this process to suit today's understanding and environment. Hopefully this clear and transparent performance indicator will help us all appreciate and applaud each others achievements and progress together.

The Base Line

The central premis of the BSS selection profile graphs is that athletes are not getting exponentially faster year on year. In time/distance measurable sports such as athletics or swimming, it is relatively easy to chart the progress top athletes make over a given distance. It is also relatively easy to then chart what the worlds best times are over a distance for U18, U19, U20 etc. As Mark Spitz famously worked out, from analyzing previous Olympic winning performances, you could accurately predict the likely time required to win a medal at the next Olympics, then extrapolate back to your current performance and plot a training programme that would deliver you to your goal.

Alpine skiing doesn't have the luxury of times over fixed distances, however in FIS points we do have a proxy for this. FIS points are a formulaic way of estimating the percentage an athlete performs behind the best in the world. The best in the world have zero FIS points, and for every % an athlete's performance is behind this world-leading standard they will receive:

- 6.10 FIS points in Slalom
- 8.70 FIS points in Giant Slalom
- 10.60 FIS points in Super Giant Slalom, and
- 13.30 FIS points in Downhill

The formula used to calculate the race penalty is simply a way of calculating the difficulty of the race in the absence of the best in the world to benchmark against. Taking an average of the best 10 times recorded for 100m sprints at ages U18, U19, U20 etc could give us a likely improvement curve for the worlds best sprinters. In the same way, taking an average of the 10 best FIS points in Slalom at U18, U19, U20 etc would reveal a remarkably consistent baseline of what the best skiers in these age groups do year in year out. Indeed almost without exception all the best skiers we have ever known have followed this remarkably similar route to the top.

The tables in fig. 1 show a comparison between the average FIS points of the best 10 athletes at U17, U18, U19, . . . through to the current oldest medalist in the discipline in SL and SG in 2006 and 2012. Explanation of how the average age of medalists is calculated is covered in the next section.

Fig 1.

FEMALE Slalom		16	17	18	19	20	21	22	Debut OWG	24	25	26	Avg. Podium Age	28	29	Oldest Ever Medalist
Avg. Best 10 YoB & Younger SL	**2006**	31.33	16.29	13.91	11.77	8.56	5.99	4.56	4.36	3.85	3.16	3.05	3.05	3.05	3.05	3.05
Avg. Best 10 YoB & Younger SL	**2012**	33.06	19.92	13.52	11.93	9.42	7.15	5.75	5.26	5.1	5.1	4.8	4.42	3.99	3.78	3.78

MALE Slalom		16	17	18	19	20	21	22	23	24	Debut OWG	26	27	28	Avg. Podium Age	30	Oldest Ever Medalist
Avg. Best 10 YoB & Younger SL	**2006**	45.21	28.74	22.38	19.55	15.07	9.63	6.29	5.2	4.88	4.52	4.52	3.76	2.95	2.37	2.37	2.01
Avg. Best 10 YoB & Younger SL	**2012**	43.91	31.13	21.55	13.25	8.96	7.71	6.89	5.78	5.78	5.17	4.64	4.28	3.70	3.21	3.21	2.94

FEMALE Super Giant Slalom		16	17	18	19	20	21	22	23	24	Debut OWG	26	27	28	Avg. Podium Age	30	31	32	Oldest Ever Medalist
Avg. Best 10 YoB & Younger SG	**2006**	46.37	25.23	21.12	18.49	14.01	10.61	7.15	5.24	4.86	4.53	4.53	4.53	4.35	4.31	4.31	4.31	4.31	3.51
Avg. Best 10 YoB & Younger SG	**2012**	51.94	30.52	21.62	17.99	12.56	7.33	7.32	5.27	4.63	4.52	4.52	4.13	2.95	2.76	2.76	2.64	2.64	2.64

MALE Super Giant Slalom		16	17	18	19	20	21	22	23	24	25	26	27	Debut OWG	29	30	31	Avg. Podium Age	33	34	Oldes Ever Medali
Avg. Best 10 YoB & Younger	**2006**	65.75	42	34.07	29.26	20.95	17.21	11.82	10.31	7.93	5.39	3.7	3.7	3.36	3.14	3.11	3.11	3.11	2.79	2.38	2.02
Avg. Best 10 YoB & Younger	**2012**	55.28	41.00	32.06	23.38	14.84	10.70	8.73	6.54	6.29	4.75	4.49	3.93	3.50	3.50	3.00	2.70	2.33	2.33	2.20	2.20

The Path to Podium & Average Age of Medalists

A similar analysis can be performed on athletes who podium at World Alpine Championships or Olympic Winter Games by looking at their FIS points held in the years prior to their podium result. This line is the 'Path to Podium'. Surprisingly the improvement curve towards podium performances in alpine skiing is noticeably steeper than that of the best 10 in the world by age group.

The implication is that there is scope for later developing athletes in alpine skiing to reach the top. Of greater usefulness however, is knowing at what age you could reasonably expect the human body to reach peak performance at in this specific sport, across disciplines.

- For the purpose of the BSS Selection Profile Graphs Fig. 2 shows the optimum medaling age calculated as an average of:
- The average age of the final top 10 in the discipline World Cup rankings at the end of the previous season (end of 2012), and
- The average age of medalists in that discipline over the last 2 Olympics Winter Games (Turin 2006 & Vancouver 2010) and 4 World Alpine Championships (Bormio 2005; Are 2007; Val d'Isere 2009; Garmisch 2011), and
- The oldest ever medalist in that discipline.

Fig 2

WOMEN	Average Age of Top 10 in World 2012	Average Age of OWG/WC Medalist 2005 – 12	Oldest Ever OWG/WC Medalist 2005 - 12	Optimum Age		MEN	Average Age of Top 10 in World 2012	Average Age of OWG/WC Medalist 2005 - 12	Oldest Ever OWG/WC Medalist 2005 - 12	Optimum Age
Slalom	27.9	25.2	30	**27.3**		**Slalom**	28.2	27.8	31	**29**
GS	26.5	24.9	30	**27.1**		**GS**	28.4	28.4	34	**30.4**
Super G	26.6	26.4	33	**28.7**		**Super G**	30.5	30.2	35	**31.7**
Downhill	28.3	25.6	33	**28.7**		**Downhill**	31.1	30.3	38	**32.9**

The BSS Selection Line

The Path to Podium gives the average improvement curve of those who win medals and more importantly an optimum age for performance in the sport as sorted by discipline and gender.

The information supplied by the analysis of the best 10 athletes in the world by discipline, gender and age provides a very durable baseline against which to measure the progress of our British athletes.

Simply put, if a young 17 year old female athlete has 80.92 Slalom FIS points we can look at the base line in 2012 and see the average of the best 10 athletes of her age is 19.92. By subtracting the 19.92 from 80.92 we get 61 FIS points. Recalling that 6.1FIS points equates to 1% in performance terms, we can see that this athlete is 10% behind the performance of the base line for the best in the world at her age.

Knowing also that the optimum age for female athletes in Slalom (fig. 2) is 27.3 years of age, then an improvement curve can be plotted for that athlete that closes the gap on the best in the world so that the 10% difference is whittled down over the 10 years – our athlete must close the gap on the best in the world by 1% per year.

At age 18 the base line in Slalom is 13.52, but this year the athlete will need to have closed to within 9% of the best in the world to be on track, so the target points the need to better will be: 13.52 + (9 x 6.1) = 68.42 FIS Points

The BSS selection line is simply the improvement line, as measured by a reducing % behind the best 10 in the world from a “variable percentage” at 16 years of age to zero by the optimum performance age for that discipline and that gender.

The “variable percentage” behind the best 10 in the world is the same for men and women at the age of 16, however varies across disciplines. The differences are listed in the BSS selection policy as being:

- SL starts at 7% behind the best 10 U17 YoB’s reducing to zero behind by average medal age,
- GS starts at 5.5% behind the best 10 U17 YoB’s reducing to zero behind by average medal age,
- SG starts at 4.5% behind the best 10 U17 YoB’s reducing to zero behind by average medal age, and

- DH starts at 3.5% behind the best 10 U17 YoB’s reducing to zero behind by average medal age.

Athletes need to record performances ahead of the BSS selection line to be eligible for selection to the BSS Alpine Ski Team.

BSS Performance Team