

The development of the Women's 400 Metres Hurdles

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“The author examines the men's and women's world rankings for the 400 metres flat and hurdles events over the past ten years. This allows him to gauge the margin for improvement in the women's 400 metres hurdles.”

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The sight of Sabine Busch, a superb athlete but technically poor hurdler, winning the World Championship 400 metres Hurdles title in Rome by more than half a second, raises the question of the development of this event in its first decade.

The event is statistically traced from the first year in which a major event was held, 1978 (European Championships) to 1987 (Table 1). This is compared with the flat event (listed in Table 2) over the same period with a set of ratios to show the “efficiency rating” (Table 3).

It can be seen that the time ratio of hurdling to flat times has been reduced from 1.122 to 1.078 (4.1%) over the period for the top-rated athlete, while the 400 flat time in the first year of A.K. (after Koch) has actually declined from 1978. However, it is the overall position which gives the evidence of improvement in the event. An examination of Table 3 shows that the efficiency levels have improved almost continuously at each level. The significance of this can be best gauged by comparison with the men's events over the same period.

Table 1 - Women's 400 metres Hurdles - table of world rankings 1978-87

	1	10	20	50	100
1978	54.89	56.67	57.43	59.18	61.10
1979	54.78	56.46	57.56	58.83	59.95
1980	54.28	56.16	56.96	58.48	58.69
1981	54.79	56.36	56.93	58.10	59.24
1982	54.57	55.76	56.48	57.86	58.79
1983	54.02	55.49	56.03	57.00	58.20
1984	53.58	54.93	55.60	56.86	58.07
1985	53.55	54.95	55.48	56.91	58.02
1986	52.94	54.76	55.62	56.79	57.89
1987	53.24	55.05	55.55	56.92	57.87
AVERAGE	54.06	55.66	56.36	57.69	58.78
RANGE	1.95	1.91	2.08	2.39	3.23

Table 2 - Women's 400 Metres - table of world rankings 1978-87

	1	10	20	50	100
1978	48.94	51.11	51.59	52.88	53.79
1979	48.60	51.00	51.55	52.49	53.30
1980	48.88	51.00	51.31	52.12	53.00
1981	48.61	51.43	51.77	52.52	53.28
1982	48.16	50.63	51.18	52.08	52.95
1983	47.99	50.63	50.99	51.89	52.77
1984	48.16	49.74	50.56	51.89	52.63
1985	47.60	50.38	51.12	52.21	52.89
1986	48.22	50.29	50.92	51.74	52.50
1987	49.38	50.41	51.11	51.88	52.64
AVERAGE	48.45	50.66	51.21	52.17	52.98
RANGE	1.78	1.69	1.21	1.14	1.29

Table 3 - Ratio of Women's 400 Metres Hurdles times to 400 Metres times

	1	10	20	50	100
1978	1.122	1.109	1.113	1.119	1.136
1979	1.127	1.107	1.117	1.121	1.125
1980	1.110	1.101	1.110	1.122	1.107
1981	1.127	1.096	1.100	1.106	1.112
1982	1.133	1.101	1.104	1.111	1.110
1983	1.126	1.096	1.099	1.098	1.103
1984	1.113	1.104	1.100	1.096	1.103
1985	1.125	1.091	1.085	1.090	1.097
1986	1.098	1.089	1.092	1.098	1.103
1987	1.078	1.092	1.087	1.097	1.099
AVERAGE	1.116	1.099	1.101	1.106	1.110

Table 4 - Men's 400 Metres Hurdles - table of world rankings 1978-87

	1	10	20	50	100
1978	47.94	49.55	49.85	50.58	51.23
1979	47.53	49.30	49.69	50.63	51.24
1980	47.13	49.24	49.69	50.25	50.99
1981	47.14	49.33	49.72	50.41	50.94
1982	47.48	48.90	49.64	50.19	50.89
1983	47.02	49.03	49.35	50.02	50.72
1984	47.32	48.74	49.40	49.92	50.52
1985	47.63	49.03	49.34	49.88	50.66
1986	47.38	48.71	49.13	49.81	50.41
1987	47.46	48.56	49.03	49.82	50.54
AVERAGE	47.40	49.04	49.48	50.15	50.81
RANGE	0.92	0.99	0.82	0.82	0.83

Table 5 - Men's 400 Metres - table of world rankings 1978-87

	1	10	20	50	100
1978	44.27	45.37	45.65	46.15	46.60
1979	44.92	45.24	45.73	46.10	46.47
1980	44.60	45.33	45.57	46.03	46.35
1981	44.58	45.18	45.54	46.02	46.31
1982	44.68	45.09	45.46	45.89	46.23
1983	44.50	44.98	45.29	45.74	46.16
1984	44.27	44.83	45.19	45.62	46.03
1985	44.47	44.91	45.11	45.52	45.99
1986	44.30	44.72	45.02	45.61	46.01
1987	44.10	44.72	45.04	45.59	46.00
AVERAGE	44.47	45.04	45.36	45.83	46.22
RANGE	0.82	0.65	0.71	0.63	0.61

Table 6 - Ratio of Men's 400 Hurdles times to 400 Metres times

	1	10	20	50	100
1978	1.083	1.092	1.092	1.096	1.099
1979	1.058	1.090	1.087	1.098	1.103
1980	1.057	1.086	1.090	1.092	1.100
1981	1.057	1.092	1.092	1.095	1.100
1982	1.063	1.084	1.092	1.094	1.101
1983	1.057	1.090	1.090	1.094	1.099
1984	1.069	1.087	1.093	1.094	1.098
1985	1.071	1.092	1.094	1.096	1.102
1986	1.070	1.089	1.091	1.092	1.096
1987	1.076	1.086	1.089	1.093	1.099
AVERAGE	1.066	1.089	1.091	1.094	1.100

Table 7 - Comparison of Women's 400 Metres Hurdles to 400 Metres flat ratios with Men's ratios

	1	10	20	50	100
1978	1.036	1.015	1.019	1.021	1.033
1979	1.065	1.016	1.028	1.021	1.020
1980	1.051	1.014	1.018	1.028	1.007
1981	1.066	1.004	1.007	1.010	1.011
1982	1.066	1.016	1.011	1.016	1.009
1983	1.065	1.005	1.008	1.004	1.004
1984	1.041	1.016	1.006	1.001	1.005
1985	1.050	0.999	0.992	0.995	0.996
1986	1.027	1.000	1.001	1.005	1.006
1987	1.002	1.006	0.998	1.004	1.001

Table 8 - All-time top-10 - Men flat-to-hurdle differential

	400m	400h	Diff.
EDWIN MOSES (USA) +	44.94	47.02	2.08
HARALD SCHMID (FRG)	44.92	47.48	2.56
DANNY HARRIS (USA)	45.19	48.48	3.29
ANDRE PHILLIPS (USA)	44.71	47.51	2.80
JOHN AKII-BUA (UGA)	45.82	47.82	2.00
ALEKSANDR VASILYEV (URS)	46.76	47.92	1.16
AMADOU DIA BA (SEN)	45.78	48.03	2.25
DAVID PATRICK (USA) +	46.24	48.05	1.81
DAVID HEMERY (GBR) +	45.44	48.12	2.68
KEVIN YOUNG (USA)	46.96	48.15	1.19
AVERAGE			2,18

+ =400 Metres relay time plus 0.84 seconds

Table 9 - All-time top-10 - Women flat-to-hurdle differential

	400m	400h	Diff.
MARINA STEPANOVA (URS)	51.25	52.94	1.69
SABINE BUSCH (GDR)	49.24	53.24	4.00
MARGARITA PONOMARYEVA (URS)	52.05	53.58	1.53
CORNELIA ULLRICH (GDR) +	51.44	53.58	2.14
MYRTLE BOTHMA (RSA)	50.12	53.74	3.62
DEBBIE FLINTOFF (AUS)	50.78	53.76	2.98
ANNA AMBRAZIENE (URS)	51.96	54.02	2.06
YEKATERINA FESENKO (URS)	52.26	54.14	1.88
ANN-LOUISE SKOGLUND (SWE)	51.69	54.15	2.46
ELLEN FIEDLER (GDR)	52.13	54.20	2.07
AVERAGE			2.44

+ =400 Metres relay time plus 0.84 seconds

The men's events, established over a much longer period, show a better "efficiency level" in each category than the women, as can be seen from examination of Table 6, while the range between best and worst marks in the 400m Hurdles tables is less in each instance than those of the women. The difference in ratios between men and women other than for the top position is marginal, and the rate of progression of women is such that one can reasonably expect the women's ratios to overtake that of the men in the next five years.

At the highest level, the difference remains because as yet, no hurdler of the calibre of Moses, or with the 400 metres potential of Koch or Kratochvilova has yet invaded the event.

The principle problem until Moses appeared was the ability to maintain 13 strides over the 35 metre stretch between hurdles, though Yuriy Lituyev, European Champion in 1950 and 1958, did experiment with this pattern in the fifties. The success of Moses with the 13-step pattern has encouraged others to try and follow suit, with improving Kevin Young being the principle exponent. The problem that the women have is that, despite shorter strides, they must also cover 35 metres between hurdles. A 14 stride approach necessitates a lead-leg changeover at each hurdle, a factor which militates against the hurdler's natural tendency to favour

one leg, and it is this above all other aspects which hinders the women vis-a-vis the men. Nevertheless, the average differential between flat times and hurdle times for the top-10 all-time men and women varies only by 0.26 seconds (2.18 to 2.44 per Tables 9 and 10).

Certain observers consider that the hurdle height for women of 76.2cm is too low, but with a variance between the flat and hurdles' records of 5.34 seconds (compared with 3.16 for the men), it would seem foolish to make any adjustments to the event at the moment.

The men's differential, were it to be emulated by the women, would produce a time of 50.76 (a performance achieved on the flat by just 13 women last year). With the problems of striding previously mentioned one cannot reasonably expect the world record to be better than 51.50 in order to be as meritorious as Moses' 47.02. Certainly the women's event has not yet seen many top class 400 flat runners, as is evidenced by the fact that the fastest of the top-10 women (Busch 49.24) is 1.64 seconds removed from the world record, while all of the top 4 men are within 1.33 seconds of Lee Evans altitude assisted world record of 43.86. With such a margin for improvement, the women's 400 hurdlers of the next decade can be expected to revolutionise the world record. □