

## TL5: Key features in the improvements of selected events

This resource is not intended to be given to pupils. The events below were chosen to give a mix of results to the question have women improved faster than men? In some cases the answer is clearly yes, in others it is less clear. Note that the question Are women still improving faster than men? Is a different question very relevant to lesson three when examining scatter plots of results. In all cases below the gold medal performances are compared over the same time period –which means the time that the women have been competing. Students are likely to begin by comparing the improvements using the total time the men have been competing. This is fine as an initial suggestion, but for several reasons it is not a fair comparison and this should emerge during lesson 1. For a discussion of the improvements the men have made since their first competition and the many unusual features of the 1896 Olympics see **TL7 1896 –A major outlier**.

### 100m track since 1928

If you compare the period when women competed: 1928-2008, then the women have improved by only slightly more than the men: 11.6% versus 10.3%, if you compare the % improvement in the best result since 1928, then the women's improvement (to the 1988 result) is now 13.6% - the men's doesn't change as 2008 was also the best ever result. However there are some outlier results that are affecting the interpretation of these figures: the 1928 men's result could be regarded as slow (1932 was 0.5 seconds faster, there is no recorded reason for this) and in 2008 Usain Bolt took 0.16 seconds off the previous fastest. Also the 1988 performances by Florence Griffith Joyner were by a long way the fastest ever by a women and there have been numerous suspicions of drug use –but nothing was established before (or after) she died at age 38. If you compared the improvements from 1932 to 2004 then the women improved 8.2% and the men 4.4%.

	% Improvement since 1928	% Improvement from 1928 to best result
Men	10.3%	10.3%
Women	11.6%	13.6%

### 400m track since 1964

Again the women have improved slightly more than the men: 4.6% to 2.4% if we take changes from 1964 (when women first ran this event) to 2008. If we take the percentage improvements from 1964 to the best performance (both in 1996) then the women lead 7.2% to 3.6%. Note that the women have shown no real improvement since 1976 and the men since 1968. The 1968 result is considered to have been helped by the thinner air of Mexico City.

	% Improvement since 1964	% Improvement from 1928 to best result
Men	2.4%	3.6%
Women	4.6%	7.2%

### 800m track since 1928 (teacher's model event)

Here the women have improved much faster than the men -16.0% to 6.4% to the 2008 result and 17.1% to 8.2% if we take improvement to the fastest ever gold medal performances. The women did not run 800m again until 1960, but if we compare

improvement since 1960, the women have still improved at least twice as much as the men.

	% Improvement since 1928	% Improvement from 1928 to best result
Men	6.4%	8.2%
Women	16.0%	17.1%

### Long jump since 1948

This is another event where the women have improved much more than the men: 23.6% to 9.1% to the 2008 results and 29.8% to 14.0% if we measure improvement to the best results (1988 and 1968 for women and men). The 1968 leap of Bob Beamon is a huge outlier, he added 55cm to the world record in a performance helped by high altitude and a tailwind.

	% Improvement since 1948	% Improvement from 1928 to best result
Men	9.1%	14.0%
Women	23.6%	29.8%

### Shot put since 1948

The difference in weights is greater here-7.26Kg to 4Kg but as with javelin the women have improved more -49.7% to 25.6% to 2008 and 63.05% to 31.3% if we measure to the best results (1980 and 1988). However neither men nor women have shown any sustained improvement since 1972. The shot putt is an event plagued by use of steroids and these were largely undetected in the 1970s and 80s.

	% Improvement since 1948	% Improvement from 1928 to best result
Men	25.6%	31.3%
Women	49.5%	63.0%

### Javelin since 1932

The women throw a lighter javelin (600g versus 800g) but they have improved much more than the men: 63.5% to 24.6% to 2008 and 71% to 30% to the best performances (1988 and 1976). Note that in 1986 (men) and 1991 (women) the javelin's centre of mass was altered in ways that made it travel a shorter distance and also land at a better angle so it would stick in more and make the throw easier to measure. Results dropped in the Olympics after these changes More reliable measurement was one reason for this change in the javelin, but the other was that the men were starting to land the javelin in the running lanes at the other end of the ground and this was risky for runners! Both men and women have improved much more in this sport than, say sprinting, one reason is better technique, but there have also been several improvements to javelins that have made them travel better.

	% Improvement since 1932	% Improvement from 1928 to best result
Men	24.9%	30.1%
Women	63.5%	71.0%

### 100m freestyle swimming since 1912

In swimming, the improvement in both men's and women's performance has been greater and much more regular than in track and field –the most recent Olympics has been the fastest in all but one of the 26 swimming events. Women did not compete in many swimming events until 1968, but have been swimming this event since 1912. Since that time they have improved 35.6% to the men's 25.6%. If we take improvement since 1968, when the number of events for women rose sharply then the women have beaten the men by a small margin 11.5% to 9.6%; these latter numbers are very similar to the numbers in all other swimming events where men and women have improved by 10-15% and usually, but not always, the women have improved by 1-2 percentage points more. Swimming results follow much smoother patterns with far fewer outlier results that track and field.

	% Improvement since 1912	% Improvement from 1928 to best result
Men	25.6%	25.6%
Women	35.4%	35.4%