INTERNATIONAL JOURNAL OF SPORTS PHYSIOLOGY AND PERFORMANCE

Fortune favors the brave. Tactical behaviors in the middle distance running events at the 2017 IAAF World Championships.

Journal:	*International Journal of Sports Physiology and Performance*
Manuscript ID	IJSPP.2018-0055.R1
Manuscript Type:	Original Investigation
Date Submitted by the Author:	13-Mar-2018
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Keywords:	Athletics, Middle Distance, Tactics, Pacing

FORTUNE FAVORS THE BRAVE. TACTICAL BEHAVIORS IN THE MIDDLE DISTANCE RUNNING EVENTS AT THE 2017 IAAF WORLD CHAMPIONSHIPS.

Running head: *Tactical behaviors in middle distance races*

Key words: Athletics, Middle distance, Tactics, Pacing.

Abstract word count: 250

Word count: 3399

Number of figures and tables: 6 Figure & 2 Tables

Abstract.

Purpose: To assess tactical and performance factors associated with progression from qualification rounds in the 800 m and 1500 m running events at the 2017 IAAF World Championships

Methods: Official results were used to access final and intermediate positions and times, as well as performance characteristics of competitors. Shared variance between intermediate positions and rank order lap times (ROSPT) with finishing positions were calculated, along with probability of automatic qualification, for athletes in each available race position at the end of every 400 m lap. Differences in race positions and lap times relative to season´s best (SB) performances were assessed between automatic qualifiers (AQ), fastest losers (FL), and non-qualifiers (NQ).

Results: Race positions at the end of each 400 m lap remained more stable through 800 m races than 1500 m races. Probability of automatic qualification decreased with both race position and ROSPT on each lap, although ROSPT accounted for a higher degree of shared variance than did intermediate position. In the 1500 m event FL ran at a higher percentage of SB speed, and adopted positions closer to the race lead in the early stages. This was not the case in the 800 m.

Conclusions: Intermediate positioning and the ability to produce a fast final race segment are strongly related to advancement from qualification rounds in middle distance running events. The adoption of a more 'risky' strategy characterized by higher speeds relative to SB may be associated with increased likelihood of qualification as FL in the 1500 m event.

Key words: athletics, middle distance, tactics, pacing.

Introduction

Successful participation in competitive endurance events requires regulation of exercise intensity in a manner that maximally utilizes available physiological resources whilst simultaneously avoiding physiological failure, a process that is reliant on continual decision-making processes. [1] Although several studies have investigated pacing strategies in middle-distance (800 m & 1500 m) running events, assessed through distribution of speeds over race segments, [2,3,4]other work has examined the influence of tactical positioning at intermediate points on finishing position. [5] Tactical issues are important in major championship races, because 'success' is based on finishing position rather than overall time achieved. This is the case in both qualifying heats (whereby a designated number of athletes progress to the next round of competition) and finals.

Regardless of the outcome goals of competition, athletes still need to regulate running speed in order to maximise the likelihood of achieving them. The precise nature of this regulatory process is not fully understood, although both rational and heuristic models have been proposed.[1] Additionally, other work has suggested that characteristics of the continually changing competitive environment influence decision-making, as athletes utilise information as it becomes available.[6] Experimental work in both the laboratory[8] and in actual competitive environments[8,9] has indeed suggested that pacing decisions are influenced by the behavior of other competitors.

Qualifying rounds at major international championships represent a particularly interesting decision-making environment, because there are two potential routes via which qualification is possible. Automatic qualification (AQ) to the subsequent stage of qualification is achieved through the securing of a high overall finishing position. Precise qualification criteria vary from championship to championship, but typically the first 2-3 finishers in 800 m races, and the first 5-6 finishers in 1500 m races progress. However, there are usually a relatively small number of 'fastest loser' (FL) qualification positions also available. Again, exact numbers vary from championship to championship. The existence of two routes through which qualification is possible, could suggest different athletes may start preliminary races with very different strategies for achieving the goal of qualifying for the next round, and a number of potential scenarios can be imagined. 'Superior' athletes (those with higher absolute performance potential, as indicated by season's best (SB) performances) may well simply aim to qualify in an automatic qualifying position by either setting an initial pace that weaker athletes are unable to sustain, or else to conserve resources for subsequent rounds by qualifying with minimal effort. 'Inferior' athletes, may aim to increase their probability of qualification through either relying on good tactical positioning and a high finishing speed to beat superior athletes, or alternatively may aim to run the fastest time they are capable of, thereby maximising their chances of qualification as a FL. All of these possible decisions may be considered rational as they involve consideration of the probabilities of various competitive outcomes, and athletes may select the strategic approach to competition that maximises the probability of their desired outcome occurring. However, it has been suggested that truly rational decision-making is unlikely within athletic events as they represent 'large world' environments, whereby some relevant information is unknown or estimated.[1] In such environments, individuals may need to make decisions based on heuristic methods that ignore some available information, or else allow their own decision-making to be informed by behaviors displayed by other competitors. [6,8,10]

Although previous work has analysed the role of tactical positioning in influencing the probability of progression from qualification rounds in the middle-distance running events at a major athletic championship[5], there is no published research which also incorporates analysis of split times. Incorporation of this variable may assist in furthering understanding of the decision-making process underpinning athlete behavior, and also generate valuable practical information for coaches and athletes preparing for such an event. This study therefore analyses positional and speed changes in athletes who qualify as AQ, qualify as FL, or fail to qualify from preliminary rounds at such an event.

Methods

SB performances, intermediate and finishing positions, and split times for each 400 m lap of athletes competing in the qualifying rounds of the men's and women's 800 m and 1500 m running events at the 2017 IAAF World Championships of Athletics were accessed via results provided by the International Association of Athletics Federations (www.iaaf.org). In the 800 m, there were six heats held for men and women in the first round (total N = 136). The first three finishers in each qualified automatically. Across all heats, the six FL also progressed to the semi-finals. These 24 athletes competed in three semi-finals, from which the top two finishers were automatic qualifiers (AQ), and two more qualified as FL across all semi-finals. Additionally, in the 1500 m, there were three heats held for men and women in the first round (total N = 136). The first six finishers in each qualified automatically. Across all heats, the six FL also progressed to the semi-finals. These 24 athletes competed in two semi-finals, from which the top five finishers were AQ, and two more qualified as FL across both semi-finals. For the 800 m races, individual split times were available for each 400 m lap, whereas for the 1500 m races, split times were available for the 400 m laps between 400 m and 800 m, 800 m and 1200 m, and the final 300 m between 1200 m and 1500 m.

For all athletes, finishing times were calculated relative to seasons best (SB) performances recorded prior to the Championship. Differences in relative level of performance achieved by AQ, FL, and athletes who failed to qualify (NQ) were assessed using one way ANOVA. For each event, mean position at each intermediate point, as well as rank order split time (ROSPT) for each segment were calculated for athletes who finished races in each available position (6–8 finishers in 800 m races and 12–15 in 1500 m races). To illustrate how ROSPT was determined, the athlete who recorded the fastest time over each intermediate segment was allocated a ROSPT of 1, the second fastest a ROSPT of 2, and so on, regardless of overall race position at each intermediate point. The percentage of shared variance in finishing position accounted for by race position at each intermediate point, and for ROSPT in each race lap was determined through calculation of r^2. The probability (*P*) of automatic qualification was calculated for each available position for each intermediate point and ROSPT. Probability was determined as the number of athletes who eventually qualified as AQ divided by the number of athletes who were in each available position, or who recorded each available ROSPT, at each intermediate point. So if, for example, 24 athletes were in 5th position at the 800 m point of the 1500m races and 18 of them went on to secure an AQ position, the probability of qualification from 5th position at 800 m would be 0.75.

In order to better understand tactical decision-making that may increase the probability of qualification to the subsequent round of qualification as a FL, segment times in 800 m (first and second 400 m) and in 1500 m (first, second, third lap and last 300 m) were calculated relative to SB for each athlete. Two way ANOVA for repeated measures followed by the Tukey post hoc test was used to assess differences between groups (AQ, FL, and NQ) in each segment. Statistical significance was accepted at $P<0.05$.

Data analysis was performed in Excel and Graphpad Prism 7. Group data is presented as mean ± s.d., and differences between groups are presented as 95% confidence intervals.

Results

In first round and semi-final races, mean finishing times were slower than SB times, and the relative level of performance achieved was similar in both events (800 m 98.4% ± 1.5% SB and 1500 m 97.7% ± 22% SB). In the 800 m, AQ recorded 98.2% ± 1.4%, FL recorded 98.5% ± 1.4% and non-qualifiers (NQ) recorded 98.3% ± 1.6% of SB (all differences NS). The situation was similar in the 1500 m, with AQ recording 97.5% ± 2.0%, FL recording 97.9% ± 2.2% and NQ recording 97.5% ± 2.3% of SB (all differences NS)

In the 800 m, position at 400 m accounted for 21.1% of the variation in final position, whereas in the 1500 m events, positions at 400 m, 800 m, and 1200 m accounted for 0%, 3.6%, and 44.9% of variation in finishing position, respectively. In the 800 m, ROSPT for the first and second laps accounted for 21.1% and 74.0% of the variation in overall finishing positions, respectively. In the 1500 m ROSPT for the first, second, and third 400 m laps and the final 300 m accounted for 0%, 9.0%, 51.8%, and 74.0% of variation in final positions, respectively.

In the 800 m races, 58.3% of the competitors who qualified automatically were in a qualifying position at 400 m. In the 1500 m races, the percentage of AQ already in qualifying positions were 32.1%, 42.9% and 65.7% at 400 m, 800 m, and 1200 m.

Race positions remained more stable throughout 800 m races (figure 1) than through the 1500 m races which visual inspection of data suggests were characterized by a greater degree of positional change (figure 2).

FIGURE 1 NEAR HERE

Figure 1. Mean intermediate positions of athletes finishing in each available position in 800 m races (error bars omitted for clarity)

FIGURE 2 NEAR HERE

Figure 2. Mean intermediate positions of athletes finishing in each available position in 1500m races (error bars omitted for clarity)

In the 800 m races, 58.3% and 79.2% of the competitors who finished in automatic qualifying positions recorded ROSPT that placed them in the required position for the first and second 400 m laps, respectively. In the 1500 m races, 32.1%, 55.4%, 73.2% and 87.5% of the competitors who finished in automatic qualifying positions recorded ROSPT that placed them in the required position for the first, second, and third laps, and final 300 m, respectively.

In both events, the probability of automatic qualification decreased with position at each intermediate point and ROSPT for each 400 m lap (Tables 1, and 2). In all cases, probability of qualification increased for those already in AQ positions, and decreased for those outside of these positions.

Table 1. Probability (P) of automatic qualification for athletes in each position at 400 m point and for athletes recording each ROSPT in the final 400 m of 800 m races.

TABLE 1 NEAR HERE

Table 2. Probability (P) of automatic qualification for athletes in each position at 400m, 800 m and 1200 m points and for athletes recording each ROSPT in the second, and third 400 m laps and final 300 m of 1500 m races.

TABLE 2 NEAR HERE

With regards to those who progressed to the next round of competition through the FL route, then in the 800 m (Figure 3) AQ were in a higher overall position (3.23 $\pm$ 2.01) at 400 m than both FL (4.56 $\pm$ 2.10) (p=0.0208, 95% CI -2.503, -0.1641) and NQ (5.13 $\pm$ 2.18) (p<0.0001, 95% CI -2.651,-1.141). In the 1500 m (Figure 4) FL maintained higher positions (4.38 $\pm$ 2.49) than AQ (7.88 $\pm$ 4.02) (p=0.0008, 95 % CI 1.26, 5.75) and NQ (7.38 $\pm$ 3.93) (p=0.0045, 95% CI -5.24 to -0.78) at the 400 m point, and higher positions (5.5 $\pm$ 3.22) than NQ (8.08 $\pm$ 3.98) (p=0.0182, -2.583; 95% CI -4.81, -0.35) at the 800m point. By 1200m, both AQ (5.02 $\pm$ 3.14) (p<0.0001, 95% CI -5.79, -2.84) and FL (6.81 $\pm$ 3.29) (p=0.0220, 95% CI -4.75, -0.29), were in higher overall positions than NQ (9.33 $\pm$ 3.65).

FIGURE 3 NEAR HERE

Figure 3. Mean race position at 400 m and 800 m points for AQ, FL, and NQ in 800 m races. $P<0.05$ *between AQ and FL, and AQ and NQ (error bars omitted for clarity)

FIGURE 4 NEAR HERE

Figure 4. Mean race position at 400 m, 800 m, 1200 m, and 1500 m points for AQ, FL, and NQ in 1500 m races. $P<0.05$ *between FL and AQ, and FL and NQ $^{\$}$between FL and NQ, $^{+}$between AQ and NQ, and FL and NQ (error bars omitted for clarity)

With regards to individual lap times relative to SB in AQ, FL, and NQ, then no differences were found between any groups in the first or second 400 m laps of the 800 m races (figure 5). However, in the 1500 m FL ran relatively more quickly (98.14 ± 3.01% SB) than AQ (94.29 ± 3.30% SB) (p=0.0022, 95% CI -6.522 to -1.178) and NQ (95.39 ± 3.90% SB) (p=0.0405, 95% CI 0.09 to 5.42) in the first 400 m lap. FL (96.22 ± 2.99% SB) also ran relatively more quickly than AQ (92.87± 4.06% SB) in the second 400 m lap (p=0.0095, 95% CI -6.02 to -068). In the final 300 m AQ (105.7 ± 2.85% SB) ran relatively faster than NQ (101.7 ± 6.36% SB). (p<0.0001, 95% CI 2.704 to 6.147) (figure 6).

FIGURE 5 NEAR HERE

Figure 5. Lap times relative to SB in NQ, FL, and AQ in 800 m races

FIGURE 6 NEAR HERE

Figure 6. Lap times relative to SB in NQ, FL, and AQ. in 1500 m races. *$P<0.05$ between groups

Discussion

The data presented in this paper demonstrates the importance of tactical positioning at intermediate points of middle distance races in determining the probability of advancement from qualifying rounds. As has been demonstrated previously,[5] no differences were found between qualifiers and non-qualifiers in terms of overall performance achieved relative to seasons best times, thereby emphasising that pacing and tactical factors alone do not determine whether or not qualification is achieved. The finding that probability of qualification increased if higher positions were maintained at intermediate points is also in line with previous analyses[5] Unlike previous analyses, a novel feature of the present study is that it also investigated the relationship between lap times and finishing position. We found that relationships between times taken for intermediate laps and finishing position were stronger than relationships between intermediate and final positions. In particular, the ability to produce a fast final race segment (400 m in the 800 m event and 300 m in the 1500 m event) seems to be important, a finding that is in agreement with previous observations that medal winning athletes in major championships display a greater increase in speed in the closing stages, and therefore a greater segment-to-segment pace variability.[4]

As has been recently demonstrated[11], the first lap in the 800 m is an important determinant of race outcome, and in our analysis the probability of automatic qualification for athletes outside the first 3 positions was already below 30% after 400 m. However, it was also below 34% for those outside the 3 fastest ROSPT over the final 400 m. In the case of 1500 m, the importance of ROSPT in the final 300 m is remarkable. The probability of automatic qualification for athletes inside the fastest 5 ROSPT over the final 300 m was not less than 80%, whereas the probability for athletes who were in the leading 5 positions at the 1200 m point was not less than 50%. Indeed, ROSPT over the final 300 m accounted for a greater degree of variability in finishing position than did race position at the 1200 m point. The finding that there were no differences in relative performance achieved (%SB) between qualifiers and non-qualifiers in either event suggests. This may therefore imply that they were able to generate higher final segment speeds through greater maintenance of physiological reserve capacity[12] in the earlier stages of the race.

Although both events are considered 'middle distance' events, our findings highlight key tactical differences. Of particular interest is the apparent stability of race positions in the 800 m (figure 1) compared to the 1500 m (figure 2). Although the reasons for this difference are unclear and we acknowledge that the relatively lower frequency of available intermediate positional data in the 800 m may to some extent limit the ability to fully understand positional change, we speculate that it may be partially related to the energetic effects of drafting. In analysis of bicycle pelotons, Trenchard[13] described a three phase model whereby the degree of positional change depended on both the differential in maximal power outputs between cyclists and the drafting benefit. At low speeds frequent positional changes are apparent as individuals share the energetically costly leading positions, but as the speed increases, 'weaker' individuals are able to maintain contact with 'stronger' individuals only by adopting following positions.

Eventually, as speeds increase further, a ‘decoupling threshold’ is reached and the group breaks up. It may have been the case that in the 800 m races, individuals of lower absolute ability were able to maintain contact with superior athletes through taking advantage of drafting benefits. However, overtaking these superior athletes in the final stages would have required unachievable increases in running speed, which would have been further exacerbated by the increased distance requirements of running around each bend in an outside lane position. In the 1500 m races, the lower absolute speeds would mean energetic savings of drafting were lower and permitted more frequent positional changes. As stated previously though, we acknowledge that higher frequency data would allow better understanding of athlete interactions during races, and in particular distances between athletes and the precise points at which groups of athletes decouple.

Of particular interest is the novel finding that athletes who qualified as FL in the 1500 m event maintained higher speeds relative to their SB, and higher race positions than other competitors at both the 400 m and 800 m points. This may suggest that these athletes adopted a more aggressive, ‘high risk’ strategy that resulted in the ‘reward’ of progression to the next round, even though they did not secure automatic qualification based on finishing position. We have no data relating to the goal setting utilized by individual athletes prior to races, but this observed behavior could plausibly be the result of a rational strategy intended to maximize the probability of qualification. This difference in behavior between FL and other athletes in the 1500 m event was not observed in the 800 m, where groups ran at similar relative speeds in each lap and positions remained more stable. However, based on the data available we are unable to explain this difference between the two events.

Practical applications

The findings of this study have several important practical applications for middle distance runners and their coaches preparing for major championships. The ability to run a fast final race segment is a key determinant of the ability to progress through qualifying rounds and should be developed through appropriate preparation. In the 800m races in particular, it is important to be in a high overall position throughout the event. Although positional change is more frequent in the 1500 m, the probability of automatic qualification is still below 50% for those outside of a qualification position at the 1200 m point. Adoption of a more aggressive early strategy in the 1500 m races may increase the likelihood of progression as a FL, even if automatic qualification is not secured. Quite how aggressive is optimal is unclear, although, in this analysis at least, FL were still running at slower than SB pace in the early stages of races, indicating even higher starting speeds may also confer some additional benefit.

Conclusions

In summary, we found that advancement from qualification rounds in the middle distance running events at a major championship is related to intermediate positioning and in particular, the ability to record a fast final race segment relative to other competitors. These findings illustrate the need for middle distance runners to maximize physiological capabilities in order to maintain a physiological reserve capacity into the final stages. The two middle distance races are very different from a tactical perspective, with the 800 m characterized by relatively stable race positions throughout, and the 1500 m by a high degree of positional change. In the 1500 m event, the adoption of a 'high risk' strategy characterized by higher relative speeds and absolute positions in the early stages of the race may increase the likelihood of progression through the competition as a FL, even if automatic qualification is not achieved. Future research may utilize higher frequency data collection in an attempt to quantify the degree of positional change in races completed at differing absolute speeds.

References

1. Renfree A, Martin L, Micklewright D, St Clair Gibson A. Application of decision making theory to the regulation of muscular work rate during self-paced competitive endurance activity. *Sports Med.* 2014;44(9):1319–1320.
2. Noakes TD, Lambert MI, Hauman R. Which lap is the slowest?: an analysis of 32 world mile record performances. *Br J Sports Med*. 2009;43(10):760–764.
3. Tucker R, Lambert, MI, Noakes TD. An analysis of pacing strategies during men's world-record performances in track athletics. *Int J Sports Physiol Perform*. 2006;1(3):233–245.
4. Mytton GJ, Archer DT, Turner L, Skorski S, Renfree A, Thompson KG, St Clair Gibson A. Increased variability of lap speeds: differentiating medalists and nonmedalists in middle-distance running and swimming events. *Int J Sports*

Physiol Perform. 2015;10(3):369 –373.

5. Renfree A, Mytton GJ, Skorski S, Clair Gibson AS. Tactical considerations in the middle-distance running events at the 2012 Olympic Games: a case study. *Int J Sports Physiol Perform*. 2014;9(2):362–364.
6. Smits BL, Pepping GJ, Hettinga FJ. Pacing and decision making in sport and exercise: the roles of perception and action in the regulation of exercise intensity. *Sports Med.* 2014;44:763–775.
7. Konings MJ, Schoenmakers PP, Walker AJ, Hettinga FJ. (2016). The behavior of an opponent alters pacing decisions in 4-km cycling time trials. *Physiology & behavior*. 2016;158:1–5.
8. Renfree A, St Clair Gibson AS. Influence of different performance levels on pacing strategy during the female World Championship marathon race. *Int J Sports Physiol Perform.* 2013;8(3):279–85.
9. Hanley B. Senior men's pacing profiles at the IAAF World Cross Country Championships. *J. Sports Sci.* 2014;32:1060–1065.
10. Renfree A, Crivoi do Carmo E, Martin L, Peters DM. (2015). The influence of collective behavior on pacing in endurance competitions. *Front Physiol.* 2015;6:373.
11. Sandford GN, Pearson S, Allen SV, Malcata RM, Kilding, AE, Ross A, Laursen, PB. Tactical behaviors in men's 800m Olympic and World Championship medallists: A changing of the guard. *Int J Sports Physiol Perform.* 2017; in press doi: 10.1123/ijspp.2016-0780.
12. Swart J, Lamberts RP, Lambert MI, Lambert EV, Woolrich RW, Johnston S, Noakes, TD. Exercising with reserve: exercise regulation by perceived exertion in relation to duration of exercise and knowledge of endpoint. *Br J of Sports*

Med. 2009;43(10):775–781.

13. Trenchard H. The peloton superorganism and protocooperative behavior. *Applied Mathematics and Computing,* 2015;270:179–192.

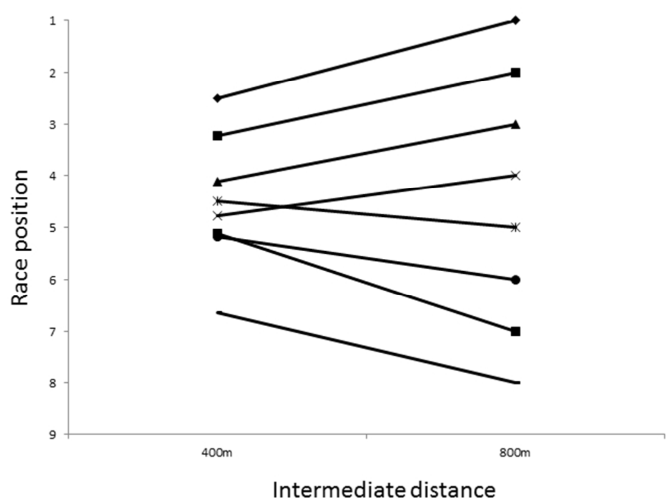

Figure 1. Mean intermediate positions of athletes finishing in each available position in 800m races (error bars omitted for clarity)

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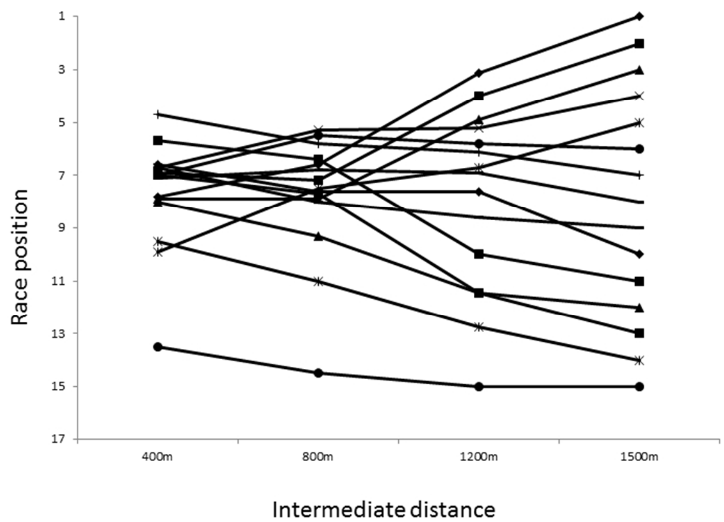

Figure 2. Mean intermediate positions of athletes finishing in each available position in 1500m races (error bars omitted for clarity)

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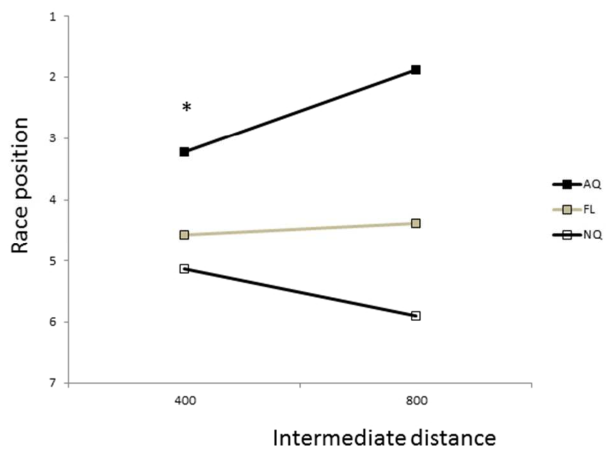

Figure 3. Mean race position at 400m and 800m points for AQ, FL and NQ in 800m races (error bars omitted for clarity)

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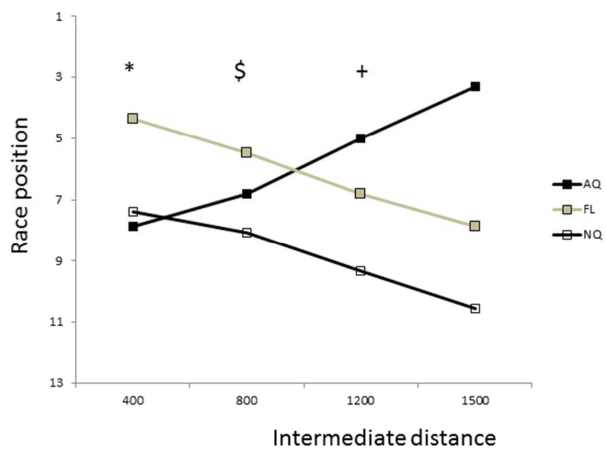

Figure 4. Mean race position at 400m, 800m, 1200m and 1500m points for AQ, FL and NQ in 1500m races (error bars omitted for clarity)

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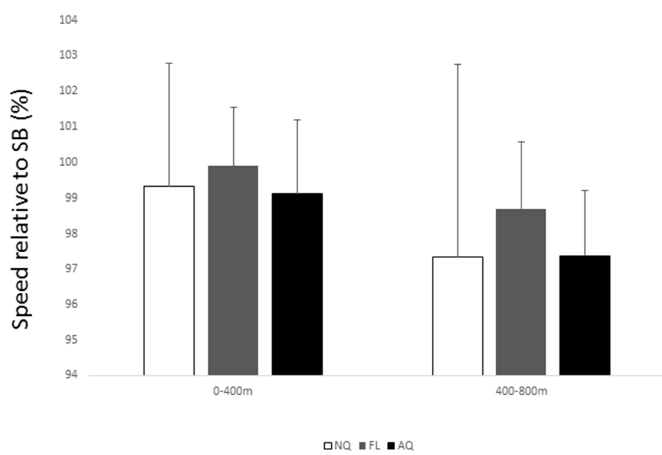

Figure 5. Lap times relative to SB in NQ, FL and AQ in 800m races.

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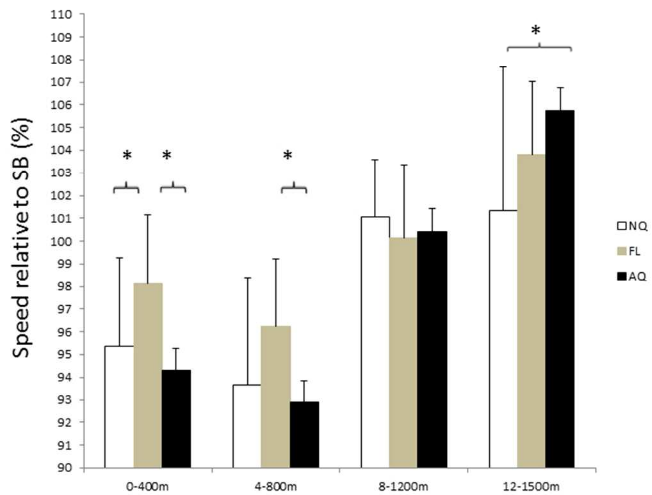

Figure 6. Lap times relative to SB in NQ, FL and AQ in 1500m races

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Table 1. Probability (P) of automatic qualification for athletes in each position at 400 m point and for athletes recording each ROSPT in the final 400 m of 800 m races.

Intermediate position and ROSPT	400 m Position	ROSPT 400 m – 800 m
1st	0.56	0.78
2nd	0.61	0.78
3rd	0.61	0.61
4th	0.28	0.33
5th	0.17	0.06
6th	0.17	0.06
7th	0.06	0
8th	0.11	0

Table 2. Probability (P) of automatic qualification for athletes in each position at 400 m, 800 m and 1200 m points and for athletes recording each ROSPT in the second, and third 400 m laps and final 300 m of 1500 m races.

Intermediate positions and ROSPT	Position at 400 m	Position at 800 m	Position at 1200 m	ROSPT 400 m – 800 m	ROSPT 800 m – 1200 m	ROSPT 1200 m – 1500 m
1st	0.40	0.50	0.80	0.70	0.90	0.90
2nd	0.20	0.40	0.50	0.60	0.60	1.0
3rd	0.50	0.60	0.80	0.60	0.80	0.80
4th	0.40	0.50	0.70	0.70	0.70	0.90
5th	0.30	0.20	0.50	0.20	0.60	0.80
6th	0.40	0.40	0.80	0.50	0.60	0.60
7th	0.40	0.80	0.30	0.40	0.20	0.20
8th	0.50	0.50	0.50	0.30	0.20	0.30
9th	0.30	0.20	0.10	0.60	0.30	0.30
10th	0.40	0.30	0.20	0.40	0.20	0
11th	0.40	0.10	0.10	0.20	0.40	0
12th	0.60	0.50	0.20	0.10	0	0
13th	0.30	0.40	0.10	0.10	0.10	0
14th	0.30	0.10	0	0.10	0	0
15th	0.10	0.10	0	0	0	0