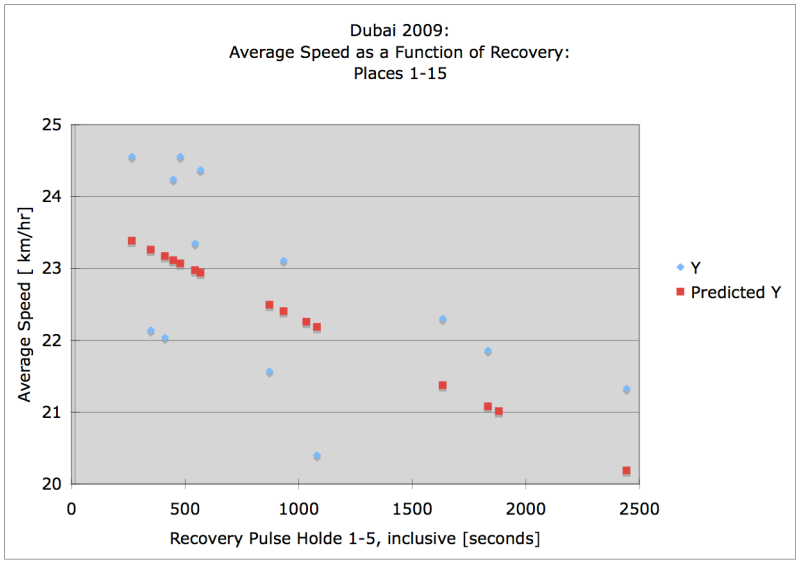
FEI Dubai 2009: Average Speed and Recovery

Abstract: As for the WEC and the Compiegne Races, there was a clear distinction between the top half and the bottom half of the finishers. The top 15's average speeds for the event showed again a strong negative correlation between the total recovery times for pulse holds 1-5 and average speed; i.e., the faster equines recovered more quickly than the slower equines with an ANOVA negative thesis value of 0.025. The bottom 15's average speeds showed the inverse; as the average speed increased, the recovery time increased with an ANOVA negative thesis of 0.08. This kind of distinction between the top half of the equines and the bottom half of the equines was also evinced for the WEC 2008 FEI and the May 2008 FEI race in Compiegne, France.

The FEI Dubai February 14, 2009 race was a race at high average speed. Each of the top 13 finishers averaged greater than 20 km/hr for the 160 km race. The average speed for the top 15 finishers was 22.3 km/hr; the average speed for the bottom 15 finishers was 17.5 km/hr. The average recovery time for pulse holds 1-5 was 980 total seconds for the top 15 or an average pulse recovery time per hold of 196 seconds. The average recovery time for the bottom 15 was 1300 total seconds or an average pulse recovery per hold of 260 seconds. From the WEC 2008 and the Compiegene 2008 analyses, the usual correlation negative correlation between recovery time and average speed was again observed; i.e., the top half of these finishers showed a correlation greater than -0.55 between average speed and recovery. The ANOVA negative thesis value was < 0.025 for the Dubai 2009 race for these top 15 finishers.

When the total recovery time for pulse holds 2-5 was considered versus average speed, the correlation coefficient for the top 15 finishers was reduced from {-0.57} to {-0.36}. The ANOVA negative thesis value increased to {0.03}. Thus, the sum of pulse recovery times other than that after the distance was completed was utilized as the independent variable. These are noted as pulse recovery times 1-5, inclusive. Inclusive indicates that the average speed was not corrected by subtracting the total recovery time for the finish time for the race.

Figure 1 shows the linear fit of average speed to recovery time, inclusive holds 1-5. Both

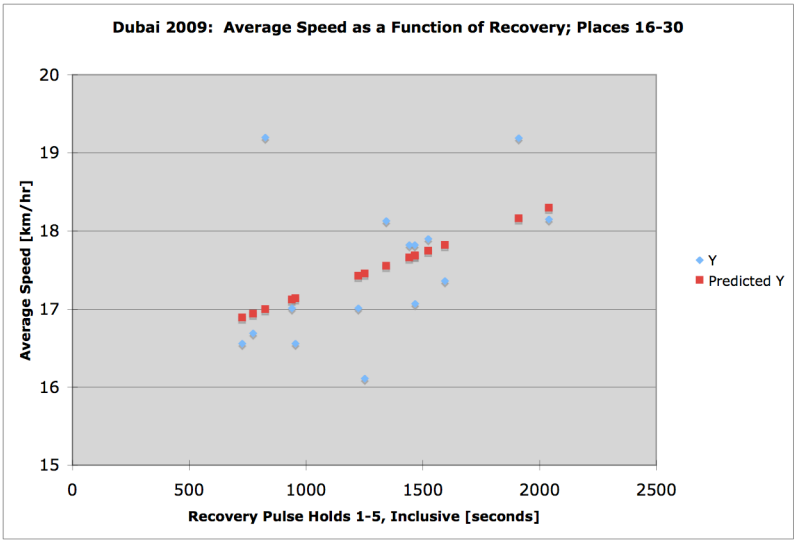


average speeds with recovery time excluded and included were tested; the correlation coefficient was some 0.02 greater (absolute value) when recovery times were included in the average time for the race. The correlation coefficient was {-0.575} for the top 15 finishers. Adding places 16 and 17, as we will discuss later, reduced the coefficient to –{-0.557}.

As was the case for the other two races analyzed, there appears to be a clear distinction between the top half of the finishers and the bottom half of the finishers. For the elite equine athletes, recovery time is a strong predictor of the time required to finish the race.

It is germane to note that as recovery time decreases for the equine, this simple regression model predicts so too will the total time for the 160 km race with high probability (greater than 97.5% probability based on ANOVA calculation). However, the bottom 15 shows a considerably different regression slope as one can see in Figure 2.

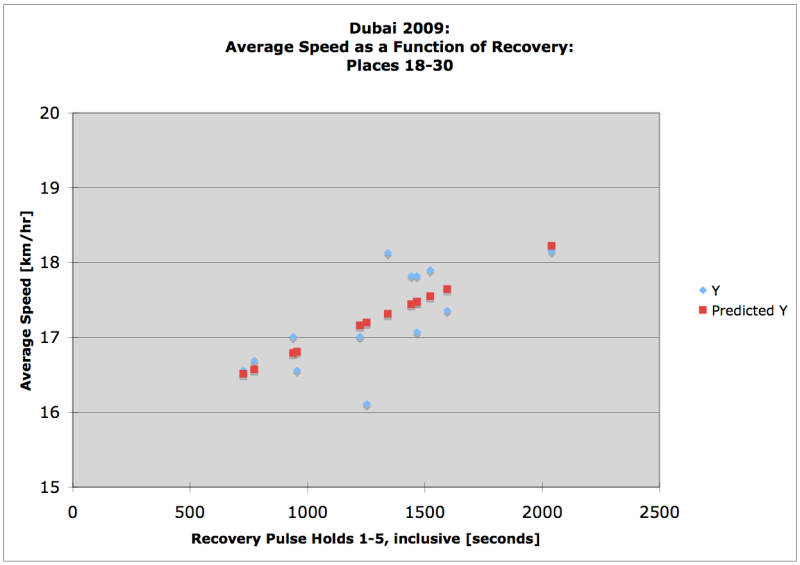
The correlation coefficient for the full 15 bottom finishers was {0.464}, which increased to {0.715} when the data set was reduced.



The ANOVA test was evaluated at 0.08 for the negative thesis. Examining the figure, the two equines with the highest average speed were removed from the data set. The sample was reduced from 15 to 13 and the bottom places from 18-30 were included in this data set. The correlation coefficient was calculated at 0.715 and the ANOVA negative thesis value was 0.005.

The bottom 13 finishers showed than a strong positive correlation between recovery time and average race speed. Hence, as the recovery time increased, the equine clearly had more stored thermal energy, and one might expect this indicates the equine was ridden harder for this sample group.

Figure 3.



For completeness, the 16 and 17th place finishers were added to the top data set and the correlation was re-calculated for the increased sample. Using now the top 17, the correlation coefficient was slightly reduced to a value of {-0.557}. By this analysis, the dividing point is very close to the 17th place finisher who evinced an average speed of 19.2 km/hour. One can see this as well by calculating the correlation coefficient for 10 samples and rolling this through the data. The inflection point occurs at approximately 16/17th places.

In conclusion, there again appears to be distinct differences between the capabilities of the top half of the finishers and the bottom half or approximately so of the finishers. In the top half, the strong negative correlation between average speed and total recovery is consistent again.

The average speed of this race was remarkably fast, much more so than Malaysia or Compiegne yet this negative correlation was again observed. There thus appears to be a clear distinction in fitness among these equine athletes.

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3/21/09