EMOTION AND PERFORMANCE IN SPORT: COMPARISON BETWEEN SPORTSWOMEN

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[Emotività e prestazione nello sport: confronto fra atlete]

ABSTRACT

The purpose of this research is to investigate aggression in professional sportswomen. Aggression understood as regulatory function, promoting or discouraging, useful to an athlete to keep the desired goals.

A number of hormones come into play in the management of aggressive behavior, one for all, considered the most important, is the testosterone.

The research work has investigated the possible implications between the expression of testosterone and aggressive behavior, understood in the positive sense in a group of sportswomen.

Key words: Women, sprints, distance runners, aggression, digit ratio.

Received January 07, 2013; Accepted January 11, 2013

Introduction

Aggression is a behavioral attitude with which everyone, almost daily, faces with.

Two major categories of aggression are commonly known, the first means the predatory aggression, instrumental, with low emotional involvement, the second indicates the hostile aggression or retaliation, with high emotional involvement⁽¹⁾.

This research was carried out to see the positive aggression, such as the intended by Wilhelm Reich⁽²⁾, that form of aggressiveness useful to achieve a goal, as a sport’s performance.

We have chosen to evaluate aggression in a sample of professional sportswomen performing athletics.

For this purpose, we compared two different groups of professional sportswomen: sprints (100 and 400-meter), archetypal anaerobic performance⁽³⁻⁶⁾, and the long distance runners (marathon and half-marathon), typical aerobic performance⁽⁷⁻¹⁰⁾, in order to identify possible differences in the expression of aggression at the base of the different choice of athletics' specialties.

Materials and methods

The sample was composed of 23 professional sportswomen, 11 sprints and 12 distance runner belonging to the Sport Team of the Universities “Foro Italico” of Rome and Catania.

Aggression was assessed by the Profile of mood states (POMS).

The POMS was designed in 1981 by Douglas M. McNair⁽¹¹⁾, of Boston University School of Medicine, in collaboration with Maurice Lorr and Leo F. Droppleman.

The version we used is based on the results of a study for the Italian adaptation of the tests performed by McNair et al. in 1989⁽¹¹⁾.

POMS measures six factors and six mood states: Tension-Anxiety (T), Depression-Dejection (D), Anger-Hostility(A), Vigor-Activity (V), Fatigue-Inertia (S), Confusion-Bewilderment (C).
The total mood disturbance (TMD) score is calculated by subtracting the V score from the sum of scores for the other dimensions.

The six factors or items are especially useful in evaluating patients with psychological disorders or stress, for possible various therapeutic approaches; the test used in normal individuals is a sensitive measure of the effects of various experimental conditions.

The questionnaire consists of 58 adjectives and attributive phrases which must be assigned a score ranging from 0 to 4 according to the intensity with which it is proved that particular state of mind.

**The digit ratio**

To detect prenatal androgen, i.e. the amount of androgens to which the subject has been exposed in utero, we used the digit ratio test\(^{(12)}\). For this purpose, the hands of sportswomen were photocopied and the distance between the metacarpo-phalangeal joint and tip of second and fourth finger was measured (2D:4D ratio). It was found that the length of fourth finger is directly related to the exposure of the fetus to testosterone: the greater length of the ring finger compared to the index finger indicates a high amount of testosterone to which the child has been exposed during pregnancy.

According to a Canadian study at the University of Alberta\(^{(12)}\), men who have the ring finger longer than the index are more aggressive and impulsive.

Other studies have, in fact, shown that index-ring finger length ratio predicts success in highly competitive sports such as football, rugby, basketball and skiing\(^{(13,14,15)}\).

**Results**

Table 1 shows the values of the 2D: 4D ratio between sprinters and distance runners.

Figure 1 shows in A the distribution of values of 2D: 4D ratio, which values are reported in Table 1, in function of the sport’s specialty; it is possible to observe a different distribution between the sprinters and the distance runners, with the latter having 2D: 4D ratio lower values than the formers, and this difference is statistically significant.

In Figure 1B it is possible to observe that 2D:4D ratio mean value of sprinters is significantly lower than distance runners one; this is indicative of a greater exposition to prenatal androgens.

<table>
<thead>
<tr>
<th></th>
<th>Sprinter</th>
<th>Distance runner</th>
</tr>
</thead>
<tbody>
<tr>
<td>2D:4D</td>
<td>0.952</td>
<td>0.98</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1.01</td>
</tr>
<tr>
<td>0.968</td>
<td>1.01</td>
<td></td>
</tr>
<tr>
<td>0.973</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1.014</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>0.971</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>0.973</td>
<td>0.98</td>
<td></td>
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<tr>
<td>0.972</td>
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<td></td>
</tr>
<tr>
<td>0.955</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td>0.93</td>
<td>0.98</td>
<td>1.05</td>
</tr>
</tbody>
</table>

Fig. 1: Digit ratio
Discussion

The results obtained from this study show that there is a significant negative correlation between the 2D:4D ratio and the factor A (Aggressiveness-Anger) in sprinters, which does not occur in distance runners. Therefore, it is possible to conclude that in approaching the choice of a specialty in sports, the genetic predisposition plays a significant influence.

The sprinters make performances lasting less than one minute; in such a short time, therefore, aggressiveness may be a key feature for achieving the objective more than cognitive assessments (plans or strategies). The distance runners, instead, play performances of very long duration (in marathon more than two hours) and, therefore, could be inferred that, in such a long time, the aggressiveness does not play a decisive role, while the executive functions (planning, problem solving, set-shifting) seem to have a more significant role.

The research confirms in a selected sample of professional sportswomen involved in athletics (sprinters and distance runners), what previous studies, such as those of Hines et al., have shown i.e. that the 2D:4D ratio appears to be related to the rate decision or to the ability to take risks.

It want to conclude with the words of Bailey and Hurd: “...much of our personality is determined by the period of life that we spend in the womb”.

References