A study of personality traits among different playing positions of volleyball players

Gurbir Singh and Dr. Sukhdev Singh

Abstract
Personality Traits were collected (N=163) from Guru Nanak Dev University, Amritsar (N=57), Punjabi University, Patiala (N=39), Panjab University, Chandigarh (N=37) and I.K. Gujral Punjab Technical University Jalandhar (N=30) with reference to playing position of volleyball players (viz. Setter, Hitter and Libero). Personality Traits questionnaire constructed by Dr. Yashvir Singh and Dr. Mahesh Bhargava in the year 1999 was utilized for the purpose of this investigation. The Statistical Package for the Social Sciences (SPSS) version 14.0 was used for all analyses. The differences in the mean of each group for selected variable were tested for the significance of difference by One-way Analysis of Variance (ANOVA). Neuroticism: - The test statistic F equals 32.500691, is not in the 95% critical value accepted range: [-∞; 3.0525]. Extraversion: - The test statistic F equals 3.517472, is not in the 95% critical value accepted range: [-∞; 3.0525]. Experience: - The test statistic F equals 1.905846, is in the 95% critical value accepted range: [-∞; 3.0525]. Agreeableness: - The test statistic F equals 2.686304, is in the 95% critical value accepted range: [-∞; 3.0525]. Conscientiousness: - The test statistic F equals 2.831001, is in the 95% critical value accepted range: [-∞; 3.0525].

Keywords: Personality traits, neuroticism, extraversion, openness to experience, agreeableness, conscientiousness

Introduction
Enhancing athletic performance is one of the main goals of sport psychology. In fact, sport can be viewed as a laboratory in which the efficiency of functioning is being investigated under high pressure and accompanying intense emotions [1], creating unique conditions for exploring the role of personality and individual differences in human performance. In the last century, sport and physical activity have earned a great importance in society. With this enhanced awareness, physical, technical and psychological improvements have become priority in sport teams with the intent of making the most of the athlete’s potentiality. In this regard, the known sport sciences such as physiology, biochemistry, medicine, biomechanics, sociology and psychology have been improved, researched and applied in competitive sport [2]. Personality traits predict a number of performance markers in competitive contexts such as work and academia [3]. Different research on personality and its relationship with individual, interpersonal and social behaviors are equally important regardless the period of time they have been argued [4, 5]. In the 60s and 70s research on athlete's personality increased exponentially, with over 1,000 published studies [6], transforming the vision over the concept and strengthening the understanding of personality. Over time, the relationship between personality and sports performance has been investigated by researchers who have used a wide variety of research methods. A particular approach compared the personality traits of athletes who compete at a high level of performance with those of athletes competing at a lower level [7]. Other studies have highlighted the effect of personality on mental states such as aggression [8] and the mechanisms used to adapt to this state [9, 10, 11].

Study population
Personality Traits were collected (N=163) from Guru Nanak Dev University, Amritsar (N=57), Punjabi University, Patiala (N=39), Panjab University, Chandigarh (N=37) and I.K. Gujral Punjab Technical University Jalandhar (N=30) with reference to playing position of inter-college volleyball players.
Table 1: Selection of subject with reference to their playing position

<table>
<thead>
<tr>
<th>Universities</th>
<th>Setter</th>
<th>Hitter</th>
<th>Libero</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guru Nanak Dev University, Amritsar</td>
<td>14</td>
<td>32</td>
<td>11</td>
<td>57</td>
</tr>
<tr>
<td>Punjabi University, Patiala</td>
<td>12</td>
<td>18</td>
<td>9</td>
<td>39</td>
</tr>
<tr>
<td>Panjab University, Chandigarh</td>
<td>10</td>
<td>20</td>
<td>7</td>
<td>37</td>
</tr>
<tr>
<td>I.K. Gujral Punjab Technical University Jalandhar</td>
<td>8</td>
<td>16</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Sample Size</td>
<td>44</td>
<td>86</td>
<td>33</td>
<td>163</td>
</tr>
</tbody>
</table>

Fig 1: Chart representation of subject with reference to their playing position

Selection of variables

For the purpose of this research, Personality Traits, were measured. As far as data collection tools were concerned, the conduction of the research involved the use of semi-structured questionnaire, which was used as a guide for the researcher.

Personality traits

Data collection through questionnaire

The main tool for gaining primary information in present research is questionnaire.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Questionnaires</th>
<th>Authors</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Personality Traits</td>
<td>Dr. Yashvir Singh and Dr. Mahesh Bhargava</td>
<td>1999</td>
</tr>
</tbody>
</table>

Statistical treatment

The Statistical Package for the Social Sciences (SPSS) version 14.0 was used for all analyses. The differences in the mean of each group for selected variable were tested for the significance of difference by One-way Analysis of Variance (ANOVA).
Results

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of square</th>
<th>Mean square</th>
<th>F statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (between groups)</td>
<td>2</td>
<td>2098.477994</td>
<td>1049.238997</td>
<td>32.500691</td>
<td>1.42819</td>
</tr>
<tr>
<td>Error (within groups)</td>
<td>160</td>
<td>5165.374457</td>
<td>32.283590</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>162</td>
<td>7263.852451</td>
<td>44.838595</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**H₀ hypothesis**
Since $p$-value $<$ α, H₀ is rejected.
Some of the groups' averages consider to not be equal.
In other words, the difference between the averages of some groups is big enough to be statistically significant.

**P-value**
$p$-value equals $1.42819e$-12, $[p (x \leq F) = 1.00000]$. This means that the chance of type1 error (rejecting a correct H₀) is small: $1.428e$-12 (1.4e-10%)
The smaller the $p$-value the stronger it supports H₁

**The statistics**
The test statistic F equals $32.500691$, is not in the 95% critical value accepted range: $[-\infty : 3.0525]$.

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of square</th>
<th>Mean square</th>
<th>F statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (between groups)</td>
<td>2</td>
<td>132.244570</td>
<td>66.122285</td>
<td>3.517472</td>
<td>0.0319898</td>
</tr>
<tr>
<td>Error (within groups)</td>
<td>160</td>
<td>3007.718727</td>
<td>18.798242</td>
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<td></td>
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<tr>
<td>Total</td>
<td>162</td>
<td>3139.963297</td>
<td>19.382489</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**H₀ hypothesis**
Since $p$-value $<$ α, H₀ is rejected.
Some of the groups' averages consider to not be equal.
In other words, the difference between the averages of some groups is big enough to be statistically significant.

**P-value**
$p$-value equals $0.0319898$, $[p (x \leq F) = 0.968010]$. This means that if we would reject H₀, the chance of type1 error (rejecting a correct H₀) would be too high: $0.1521$ (15.21%).
The bigger the $p$-value the stronger it supports H₀

**The statistics**
The test statistic F equals $3.517472$, is not in the 95% critical value accepted range: $[-\infty : 3.0525]$.

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of square</th>
<th>Mean square</th>
<th>F Statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (between groups)</td>
<td>2</td>
<td>73.164334</td>
<td>36.582167</td>
<td>1.905846</td>
<td>0.152057</td>
</tr>
<tr>
<td>Error (within groups)</td>
<td>160</td>
<td>3071.154354</td>
<td>19.194715</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>162</td>
<td>3144.318354</td>
<td>19.409375</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**H₀ hypothesis**
Since $p$-value $>$ α, H₀ is accepted.
The averages of all groups considered to be equal.
In other words, the difference between the averages of all groups is not big enough to be statistically significant.

**P-value**
$p$-value equals $0.152057$, $[p (x \leq F) = 0.847943]$. This means that if we would reject H₀, the chance of type1 error (rejecting a correct H₀) would be too high: $0.1521$ (15.21%).
The bigger the $p$-value the stronger it supports H₀

**The statistics**
The test statistic F equals $1.905846$, is in the 95% critical value accepted range: $[-\infty : 3.0525]$.

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of square</th>
<th>Mean square</th>
<th>F statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (between groups)</td>
<td>2</td>
<td>138.290025</td>
<td>69.145013</td>
<td>2.686304</td>
<td>0.0712053</td>
</tr>
<tr>
<td>Error (within groups)</td>
<td>160</td>
<td>4118.372819</td>
<td>25.739830</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>162</td>
<td>4256.662844</td>
<td>26.275697</td>
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<td></td>
</tr>
</tbody>
</table>
Table 6: ANOVA analysis of conscientiousness

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of square</th>
<th>Mean square</th>
<th>F statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups (between groups)</td>
<td>2</td>
<td>106.718105</td>
<td>53.359053</td>
<td>2.831001</td>
<td>0.0619107</td>
</tr>
<tr>
<td>Error (within groups)</td>
<td>160</td>
<td>3015.699059</td>
<td>18.848119</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>162</td>
<td>3122.417164</td>
<td>19.274180</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

H₀ hypothesis
Since p-value > α, H₀ is accepted.
The averages of all groups considered to be equal.
In other words, the difference between the averages of all groups is not big enough to be statistically significant.

P-value
p-value equals 0.0619107, [p (x ≤ F) = 0.938089]. This means that if we would reject H₀, the chance of type1 error (rejecting a correct H₀) would be too high: 0.0619 (6.19%).
The bigger the p-value the stronger it supports H₀.

The statistics
The test statistic F equals 2.831001, is in the 95% critical value accepted range: [-∞: 3.0525]

Conclusions
Neuroticism
The test statistic F equals 32.500691, is not in the 95% critical value accepted range: [-∞: 3.0525].

Extraversion
The test statistic F equals 3.517472, is not in the 95% critical value accepted range: [-∞: 3.0525].

Openness to experience
The test statistic F equals 1.905846, is in the 95% critical value accepted range: [-∞: 3.0525].

Agreeableness
The test statistic F equals 2.686304, is in the 95% critical value accepted range: [-∞: 3.0525].

Conscientiousness
The test statistic F equals 2.831001, is in the 95% critical value accepted range: [-∞: 3.0525].

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Conflict of interests
The authors declare no conflict of interest.

References