



Associations between personality, sports participation and athletic success. A comparison of Big Five in sporting and non-sporting adults



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ABSTRACT

The present study investigates whether the Big Five personality traits are different among diverse sports populations. A sample of 881 male athletes and non-athletes completed a self-report questionnaire measuring their personality traits. The Exploratory Structure Equation Modeling (ESEM) approach is adopted to test measurement invariance and mean differences among groups. The results indicate that athletes who had experienced the most success in their sport scored higher than non-athletes in each personality dimension of the Big Five, with the exception of openness, while less successful athletes scored higher than non-athletes only in extraversion and agreeableness. The more successful athletes showed higher agreeableness, conscientiousness, and emotional stability than the less successful athletes. Individual-sport athletes were found to be more energetic and open than team-sport athletes. The current findings help clarify the relationships between personality traits, sports participation and athletic success.

1. Introduction

The study of personality in sports psychology is primarily focused on investigating the associations between personality, participation, and athletic achievement (Aidman & Schofield, 2004; Allen, Greenlees, & Jones, 2013; Allen & Laborde, 2014).

Previous research is either framed in the theory of the Big Five personality traits (Goldberg, 1993; McCrae & Costa, 1996) or Eysenck personality theory (Eysenck, 1970). The Big Five theory presents a model in which personality is organized into five factors: extraversion, agreeableness, conscientiousness, emotional stability and openness.¹ Meanwhile, the Eysenck personality theory states that personality is made up of three main factors: extraversion, neuroticism – corresponding to extraversion and emotional stability in the Big Five theory (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993) – and psychoticism.

Although associations between personality traits and natural variations in physical activity have been consistently shown – for example, between participation in regular exercise and extraversion, conscientiousness, emotional stability, and openness (Rhodes & Smith, 2006; Wilson & Dishman, 2015) – the association between personality and participation in organized sports has received modest attention and remains less clear. Taken together, previous findings referring to the

context of organized sports have suggested that athletes score higher on extraversion (Egloff & Gruhn, 1996; Paunonen, 2003), conscientiousness (Kajtna, Tušak, Barić, & Burnik, 2004; Malinauskas, Dumciene, Mamkus, & Venckunas, 2014), emotional stability (Egan & Stelmack, 2003; Kajtna et al., 2004; Mckelvie, Lemieux, & Stout, 2003), and openness (Kajtna et al., 2004) than non-athletes. Moreover, further results have suggested that personality traits are also related to the participation in specific types of sports. More specifically, individual-sport athletes demonstrated higher conscientiousness, openness and emotional stability as well as lower levels of extraversion than team-sport athletes (Allen, Greenlees, & Jones, 2011; Eagleton, McKelvie, & De Man, 2007).

In sports psychology, investigation of the association between personality and athletic success is a very attractive issue that permits an understanding of whether and which personality traits coincide with greater levels of success. The association is rather complex, and a variety of motivational and dispositional variables that are correlated with sports performance and success has been investigated (e.g., Baretta, Greco, & Steca, 2017). Athletic success has mainly been operationalized in terms of the competition level at which athletes compete (Allen et al., 2013), and previous results on the Big Five have shown that high-level athletes (e.g., athletes competing at a national or international level) are more agreeable, conscientious, and emotionally

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¹ Several names have been used in referring to the Big Five factors. Such names include (1) extraversion vs. introversion (or energy, or surgency); (2) agreeableness (or friendly compliance vs. hostility, or friendliness); (3) conscientiousness (or will); (4) neuroticism vs. emotional stability; and (5) openness to experience (or culture, or openness, or intellect).

stable (Allen et al., 2011; Kirkcaldy, 1982) than low-level athletes (e.g., athletes competing at a county or regional level).

Although previous findings evidenced associations among personality and various sporting populations, some critical flaws limit the conclusions that can be drawn from the available research. A first concern regards the sample sizes adopted in previous studies. While research regarding personality and physical activity usually involves hundreds or even thousands of participants per study (Rhodes & Smith, 2006), research on personality and sports participation uses sample sizes that barely exceed 200 participants (Allen et al., 2011; Malinauskas et al., 2014; Paunonen, 2003) and, in the worst cases, can amount to a mere 40 subjects per sports population (Eagleton et al., 2007).

Second, samples involved in previous studies were extremely heterogeneous because various sports were included in each study (Allen et al., 2011; Eagleton et al., 2007). Sports differ from each other in several ways, and each sport has its own specificity and requirements. For instance, sports may differ in terms of pressure (i.e., some sports are performed on multiple trials while other ones are one-shot trials against time) and in terms of intensity and duration (i.e., some sports last few seconds or minutes, while other ones may last hours). This type of heterogeneity affects comparisons between different studies because the sports considered are not equivalent. Thus, it is possible to argue that various results may be due, at least partially, to distinctive features that characterize each sport. An extreme example illustrating the lack of consideration placed on sport specificity involves cases in which the types of sports considered in studies are not even mentioned (Allen et al., 2011; Kirkcaldy, 1982). Another issue regards the operationalization of sports participation; indeed, within the sporting population there may be great variability regarding athletic success and performance that should be taken into account instead of grouping all sport participants in one *sporting* group. These omissions make comparisons among studies difficult and prevent researchers from reaching valid conclusions about the relationship between traits and sports practice. More specifically, this issue is reflected by a lack of effect size synthesis referring to the difference in personality traits (Allen et al., 2013). To manage these issues, it is necessary to i) accumulate a more substantial body of literature reporting effect sizes and ii) precisely define the outcome variables (e.g., sport performance, success, training time) and find an agreement on how to operationalize them. In this direction, a further aspect that deserves consideration is the adoption of statistical methodologies that take into account the latent psychometric constructs and subsequent systematic tests of measurement invariance (Meredith, 1993). Specifically, a comparison between groups as is usually performed (i.e., *t*-test, ANOVA) requires prerequisite assumptions of invariant measurement operations across the groups being compared (Vandenberg & Lance, 2000). If such invariance across sports populations is not achieved, it is not possible to draw scientific conclusions as to how the group differences may be associated with personality dimensions. To test invariance, in recent years, a few studies (Marsh et al., 2010; Marsh, Morin, Parker, & Kaur, 2014) have noted that the classic Confirmatory Factor Analysis (CFA) is inappropriate for testing structure and invariance across groups of Big Five measures. This suggestion is in line with the position argued by Big Five researchers for years (e.g., Church & Burke, 1994; McCrae, Zonderman, Costa, Bond, & Paunonen, 1996) and with previous unsuccessful attempts to test Big Five measure structures through CFA (e.g., Cooper, Smillie, & Corr, 2010; Vassend & Skrandal, 1997). To overcome these limits, recent research has started to apply Exploratory Structure Equation Modeling (ESEM; Asparouhov & Muthén, 2009) to Big Five data (Chiorri, Marsh, Ubbiali, & Donati, 2016; Marsh et al., 2010;

Table 1
Sample size information for each sports group and subgroup.

	Individual sport (<i>n</i> = 135)	Team sport (<i>n</i> = 620)	
	Track and field (<i>n</i> = 135)	Soccer (<i>n</i> = 230)	Basketball (<i>n</i> = 390)
Low-level athletes (<i>n</i> = 558)	73	179	306
High-level athletes (<i>n</i> = 197)	62	51	84

Marsh, Nagengast, & Morin, 2013). The advantages of the ESEM approach rely on exploiting the advanced statistical methods typically associated with CFAs and SEMs (e.g., testing for measurement invariance across groups, incorporate latent factors into subsequent analysis) without relying on excessively restrictive CFA constraints (i.e., secondary loadings fixed to zero). For these reasons, the ESEM approach has been proposed to be particularly suitable for testing the dimensionality and measurement invariance for Big Five measures (Marsh et al., 2014).

1.1. The present study

The purpose of the present study was to explore the relationship among Big Five personality traits and involvement and success in organized sports, a context that has received little attention in the large array of physical activity. The present study aims to overcome most of the limitations of previous research to derive clearer and more valid conclusions on the associations between personality and sports participation. In particular, as claimed by Allen et al. (2013), the present research provides detailed information about the effect size related to population-based differences. Moreover, in line with recent suggestions (Marsh et al., 2010), the ESEM approach has been adopted to test measurement invariance and mean differences across the groups considered.

Based on the most consistent results from available literature, the following hypotheses were developed:

- It was expected that non-athletes would have lower levels of extraversion, conscientiousness, and emotional stability than athletes.
- High-level athletes were expected to be more agreeable, conscientious, and emotionally stable than low-level athletes.
- It was expected that individual-sport athletes would report more conscientiousness, openness, and emotional stability than team-sport athletes.

2. Material and methods

2.1. Participants

Participants who took part in this study were Italian male athletes (*n* = 755; mean age = 22.62; *SD* = 3.56) and non-athletes (*n* = 126; mean age = 23.78; *SD* = 2.84) aged between 18 and 30. The athletes (see Table 1) competed in individual (track and field; *n* = 135; mean age = 22.07; *SD* = 3.45) or team sports (soccer and basketball; *n* = 620; mean age = 22.74; *SD* = 3.58). Athletes competing at regional levels were categorized as low-level athletes (LLA; *n* = 558; mean age = 22.25; *SD* = 3.42), while those competing at the national

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