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Olympic coaching excellence: A quantitative study of Olympic swimmers' perceptions of their coaches

Gillian M. Cook , David Fletcher  and Michael Peyrebrune

School of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, UK

ABSTRACT

Although coaching is a co-created process, researchers investigating the psychological aspects of Olympic coaching have tended to overlook the perceptions of athletes and whether these distinguish between performance-related outcomes. The objective of this research was to examine whether athletes' perceptions of their coaches discriminate between world-leading (i.e., Olympic gold medal winning) and world-class (i.e., Olympic non-gold medal winning) coaches. Observer-reported psychometric questionnaires were completed by 38 Olympic swimmers who had collectively won 59 Olympic medals, of which 31 were gold. The questionnaires assessed perceptions of 12 variables within the Big Five personality traits, the dark triad, and emotional intelligence, and the data was analyzed using three one-way multivariate analysis of variance and follow-up univariate F-tests. The results showed that world-leading coaches were perceived to be significantly higher on conscientiousness, openness to experience, perception of emotion, and management of others emotion, and lower on narcissism, than world-class coaches. This suggests that athletes' perceptions of their coaches may discriminate between world-leading and world-class coaches. The implications for coaches' psychological development are discussed and compared with previously reported Olympic coaches' perceptions of themselves.

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Coach; elite; psychology; sport; swimming

The Olympic Games are considered to be the most prestigious sporting competition in the world due to their size, multi-sport format, and global reach (Cogan, 2019). Winning an Olympic gold medal represents the pinnacle of an athlete's performance achievement (Gould & Maynard, 2009) and researchers have emphasized the vital role of the coach in attaining this success (Cook & Fletcher, 2017; Hardy et al., 2017; Rees et al., 2016). The coach's primary role is to positively influence athletes' physical, technical, tactical, and psychological development (Jones & Kingston, 2013; Lyle & Cushion, 2016), and Mallett and Lara-Bercial (2016) argued that it is increasingly necessary to develop an evidence-based understanding of the psychological characteristics of effective coaches. Indeed, previous research has demonstrated the influence of coaches' personalities, affective responses, and behavioral on athlete outcomes (e.g., Allen et al., 2013; Hwang et al., 2013; Jackson et al., 2011; Laborde et al., 2016, 2017; Roberts et al., 2018; Vaughan et al., 2019; Yang et al., 2015).

In a systematic review of psychosocial aspects of coaching in Olympic sport, Cook, Fletcher, Carroll et al. (2021) identified coach traits, states, and behaviors that were perceived to have a facilitative, debilitating, or non-categorized effect on athlete performance. However, the authors noted that the effect of coaches' psychological characteristics on athlete performance-related outcomes was unclear because the included studies investigated Olympic coaches as a homogenous group, and did not use comparative designs to better understand the factors associated with athlete success. Building on this review, Cook, Fletcher, Peyrebrune et al. (2021) examined whether

psychological characteristics discriminate between world-leading coaches, operationalized as those who had trained at least one swimmer to win a minimum of one Olympic gold medal, and world-class coaches, operationalized as those who had trained at least one swimmer to compete at an Olympic Games but had never trained a swimmer to win an Olympic gold medal. Differentiating factors were investigated across the Big Five personality traits of conscientiousness, openness, agreeableness, extraversion, and neuroticism (Costa & McCrae, 2010), the dark triad of Machiavellianism, psychopathy and narcissism (Paulhus & Williams, 2002), and emotional intelligence, which relates to individuals' responses to interpersonal or intrapersonal emotional information (Mayer et al., 2008; Petrides et al., 2007). The results showed that world-leading coaches were higher on the Big Five trait of agreeableness, and the emotional intelligence components of both perception of emotion and management of own emotion, and were lower on the dark traits of Machiavellianism and narcissism, in comparison with world-class coaches. A limitation of this study was, however, the use of self-report measures which may be prone to self-deception bias (Colbert et al., 2012; Morgeson et al., 2007). In other words, coaches' perceptions of their own psychological attributes may differ from their actual psychological tendencies because they may lack the necessary self-insight to accurately report their traits (Paulhus & Reid, 1984).

An adjunct to self-reports of psychological characteristics are observer ratings, which are widely used in organizational psychology (Oh et al., 2011). When used together, observer-ratings and self-ratings capture unique and often differing information

about an individual (Colbert et al., 2012). In accordance with Hogan's (1991) socioanalytic theory of personality, self-reports of personality capture an individual's identity and their perceptions of themselves, and are based on inward perceptions of traits and intrapersonal processes. In contrast, observer-ratings capture an individual's reputation and other's perception of the individual, and are based on an individual's outward expression of traits and behavioral cues. Given that coaching is a process that is co-created in social and relational interactions between people (Cushion, 2010; Jowett, 2017), athletes' perceptions provide an important source of unique and highly relevant information about coaches. Indeed, coaches and the process of coaching cannot be fully understood without considering the perspectives of athletes. Little is known about Olympic athletes' perceptions of coaches, and no research has examined athletes' perceptions of Olympic gold medal winning coaches in comparison with Olympic non-gold medal winning coaches. This is surprising given that athletes' perceptions effect the coach-athlete relationship (Jowett & Cockerill, 2003), which has a demonstrable influence on athletes' physical and psychosocial development (Davis & Jowett, 2014), well-being (Felton & Jowett, 2013), and performance (Rhind & Jowett, 2010).

Researchers investigating the psychological aspects of Olympic coaching have tended to overlook the perceptions of athletes and whether they distinguish between performance-related outcomes. The objective of this research, therefore, was to examine whether athletes' perceptions of their coaches discriminate between world-leading and world-class coaches. Based on the existing literature, it was hypothesized that: (H1) conscientiousness; (H2) openness to experience; (H3) agreeableness; (H4) extraversion would be perceived as higher; and (H5) neuroticism would be perceived as lower for the world-leading coaches in comparison with world-class coaches. In relation to the dark triad, it was hypothesized that: (H6) Machiavellianism; (H7) psychopathy; and (H8) narcissism would be perceived as lower for the world-leading coaches in comparison with world-class coaches. In addition, based on the emotional intelligence literature, it was hypothesized that: (H9) perception of emotion; (H10) management of own emotion; (H11) management of others emotion; and (H12) utilization of emotion would be perceived as higher for world-leading coaches in comparison with world-class coaches.

Method

Participants

Participants were 38 Olympic swimmers (18 male, 20 female), ranging in age from 19 to 36 years ($M = 26.37$, $SD = 4.60$). Collectively, the participants had won 59 Olympic medals, of which 31 were gold medals. Sixteen of the participants had represented Australia at the Olympic Games, 11 the United States of America, 10 Great Britain, and one the Netherlands. Participants reported working with their coaches between two and 10 years prior to their first Olympic Games ($M = 4.23$, and $SD = 2.54$), and had competed in between one and four Olympic Games ($M = 2.14$, and $SD = 0.90$). Participants were selected and grouped using a non-probability criterion sampling technique as it allows for the deliberate selection of individuals who are

especially knowledgeable about the research question (Creswell, 2014). The recruitment process involved identifying and approaching swimmers who had been coached by participants from Cook, Fletcher, Carroll et al.'s (2021) investigation of Olympic coaching. The participants were divided into a world-leading group of 23 swimmers and a world-class group of 15 swimmers. Consistent with the procedure adopted by Cook, Fletcher, Peyrebrune et al. (2021), the label world-leading was operationalized as swimmers whose coach had trained at least one swimmer to win a minimum of one Olympic gold medal, and the label world-class was operationalized as swimmers whose coach had trained at least one swimmer to compete at an Olympic Games but had never trained a swimmer to win an Olympic gold medal.

The potential sample size was limited due to the specific and restrictive nature of the inclusion criteria, which required participants' coaches to be currently active and to have worked with their coach for a minimum of two years immediately prior to competing at an Olympic Games. Large sample sizes are not typical of quantitative studies with Olympic populations (e.g., Cook, Fletcher, Peyrebrune et al., 2021; Gould et al., 2002; Güllich et al., 2019; Mallett & Coulter, 2016; Pensgaard & Roberts, 2002). Given that high-level performers constitute a small sub-population of the general population, expertise research typically involves very small sample sizes (Abt et al., 2020; Bacchetti et al., 2011). Simonton (1999, 2014) observed that conventional sample sizes for specialized groups are not feasible. In more conventional research studies participants can be drawn from an indefinitely large pool of participants and "one subject is as good as any other" (Simonton, 1999, p. 425). However, when researching eminent or significant individuals, "it would be problematic to suggest that these notables are completely interchangeable . . . on the contrary, these individuals are presumably selected precisely because they are, at least to some extent, *sui generis* [translation: in a class of their own]" (Simonton, 1999, p. 425). In these ultra-rare populations, small sample sizes are justified using the value of information approach (Ploutz-Snyder et al., 2014), with highly relevant knowledge being produced from small-*n* research (Bacchetti, 2013).

Procedure

Following institutional ethical approval, the data was collected by the first author across 14 cities in three continents. Potential participants were contacted via direct correspondence, informed of the purpose of the study, and invited to participate. After providing informed consent, questionnaire protocols were explained, and participants were asked to complete demographic questions and the primary measures. When responding to each item, participants were asked to reflect on their interactions in general with their coach.

Measures

Big five personality traits

The participants assessed their coach's Big Five personality traits using the 44-item Big Five Inventory (BFI; John & Srivastava, 1999), which consists of five subscales measuring

conscientiousness, openness to experience, agreeableness, extraversion, and neuroticism. Using the contextualized stem “my coach is someone who ...”, participants responded to items such as: “keeps working until things are done,” “is creative and inventive,” “is considerate and kind to almost everyone,” “is full of energy,” and “gets nervous easily.” Participants reported the extent to which they agreed with each statement on a 5-point Likert scales ranging from 1 (disagree strongly) to 5 (agree strongly). The BFI can be utilized as an observer-report measure (John & Srivastava, 1999), has been widely used in sport (Kaiseler et al., 2017), and has demonstrated acceptable reliability and predicative validity in previous research (Camps et al., 2016). Cronbach’s alpha in the present sample for conscientiousness was .84, openness was .80, agreeableness was .85, extraversion was .81, and neuroticism was .89.

Dark triad

The participants assessed their coach’s dark triad using a modified version of the 12-item Dirty Dozen (Jonason & Webster, 2010), which consists of three subscales measuring Machiavellianism, psychopathy, and narcissism. Participants responded to items such as: “your coach has used flattery to get their way,” “your coach tends to be callous or insensitive,” and “your coach tends to want others to admire them.” Participants indicated the extent to which they agreed with each statement on a 5-point Likert scales ranging from 1 (disagree strongly) to 5 (agree strongly). This measure has been previously used in research as an observer report and has demonstrated high reliability and predicative validity (Volmer et al., 2016). Cronbach’s alpha in the present sample for Machiavellianism was .79, psychopathy was .73, and narcissism was .81.

Emotional intelligence

The participants assessed their coach’s emotional intelligence using a modified version of the 33-item Schutte Emotional Intelligence Scale (EIS; Schutte et al., 1998), which consists of four subscales measuring perception of emotion, management

of own emotion, management of others emotion, and utilization of emotion. The scale consists of questions such as: “by looking at their facial expressions, your coach can recognize the emotions people are experiencing,” “your coach knows when to speak about their personal problems to others,” “other people find it easy to confide in your coach,” and “when your coach is in a positive mood, they are able to come up with new ideas.” Participants reported the extent to which they agreed with each statement on a 5-point Likert scales ranging from 1 (disagree strongly) to 5 (agree strongly). The EIS is the most widely used emotional intelligence scale within sport research (Laborde et al., 2016), has been utilized as an observer-rating measure (Ölçer et al., 2014), and demonstrated acceptable reliability and predictive validity in previous research (Marks et al., 2016; Schutte et al., 1998). Cronbach’s alpha in the present sample for perception of emotion was .86, management of own emotion was .70, management of others emotion was .71, and utilization of emotion was .62.

Results

The Statistical Package for Social Sciences (SPSS; Version 26.0) was used for all statistical analyses. Table 1 presents the means, standard deviations and effect sizes among the study variables for the world-leading ($n = 23$) and world-class ($n = 15$) groups, and the correlations between traits across the groups.

Big five personality traits

A one-way MANOVA with one independent variable (world-leading vs. world-class) was conducted with the Big Five dependent variables of conscientiousness, openness, agreeableness, extraversion, and neuroticism (hypotheses H1, H2, H3, H4, and H5). Variances and covariances were homogenous across the five dependent variables (Levene’s and Box’s test $p > 0.05$). The results revealed a significant multivariate difference between the world-leading and world-class groups ($F(5, 32) = 2.97$, $p = .03$, $\eta^2 = .32$, Wilks’ $\lambda = .68$), and a large effect size was observed. A compromise power analysis ($N = 38$, groups = 2, and response variables = 5) indicated that the MANOVA

Table 1. Means, standard deviations, cohen’s d, and correlations among study variables.

Variables	Group				<i>d</i>	1	2	3	4	5	6	7	8	9	10	11	12
	World-leading		World-class														
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>													
The Big Five																	
1. Conscientiousness	4.31	.48	3.76	.75	.87*	-											
2. Openness	4.25	.50	3.87	.57	.71*	.07	-										
3. Agreeableness	4.00	.65	3.87	.82	.18	.39*	.09	-									
4. Extraversion	4.18	.63	4.30	.59	-.19	.06	.28	.23	-								
5. Neuroticism	2.17	.78	2.53	1.03	-.39	-.38*	-.23	-.56*	-.16	-							
The Dark Triad																	
6. Machiavellianism	7.52	3.30	9.80	3.91	-.63	-.45*	.07	-.47*	.26	.47*	-						
7. Psychopathy	7.74	2.94	8.00	3.55	-.08	-.49*	.11	-.63*	.04	.29	.66*	-					
8. Narcissism	7.57	3.01	10.87	4.42	-.87*	-.44*	-.32	-.48*	-.01	.47*	.58*	.50*	-				
Emotional Intelligence																	
9. Perception of emotion	40.83	4.75	36.40	8.01	.67*	.41*	.49*	.45*	.39*	-.43*	-.18	-.17	-.50*	-			
10. Managing own emotion	38.30	4.00	36.33	3.99	.49	.32	.39*	.56*	.52*	-.61*	-.19	-.28	-.49*	.63*	-		
11. Managing others emotion	31.52	4.02	27.27	3.43	1.14*	.44*	.39*	.49*	.41*	-.39*	-.12	-.23	-.46*	.72*	.72*	-	
12. Utilization of emotion	24.17	2.29	23.67	3.04	.19	-.01	.37*	-.11	.16	.29	.23	.01	-.01	.22	.19	.24	-

Note. * $p < 0.05$

achieved power of 0.36. Follow-up univariate F-tests identified significant group differences in conscientiousness $F(1, 36) = 7.44, p = .01, \eta^2 = .17$, and openness $F(1, 36) = 4.53, p = .04, \eta^2 = .11$, but not agreeableness $F(1, 36) = 0.28, p = .60, \eta^2 = .008$, extraversion $F(1, 36) = 0.35, p = .56, \eta^2 = .01$, or neuroticism $F(1, 36) = 1.47, p = .23, \eta^2 = .04$. A compromise power analysis (one-tailed, effect size $d = 0.5$, beta/alpha ratio = 4, and group 1 $N = 23$ and group 2 $N = 15$) indicated power of 0.59 to detect a medium effect. Mean scores revealed that the world-leading group scored higher on conscientiousness ($M = 4.31$) in comparison with world-class group ($M = 3.76$), and the world-leading group scored higher on openness ($M = 4.25$) in comparison with world-class group ($M = 3.87$).

Dark triad

A one-way MANOVA with one independent variable was conducted with the three dark triad dependent variables of Machiavellianism, psychopathy, and narcissism (hypotheses H6, H7, and H8). Variances and covariances were homogenous across the three dependent variables (Levene's and Box's test $p > 0.05$). The results revealed a significant multivariate difference between the world-leading and world-class groups ($F(3, 34) = 3.85, p = .02, \eta^2 = .25, \text{Wilks' } \lambda = .75$), and a large effect size was observed. A compromise power analysis ($N = 38$, groups = 2, and response variables = 3) indicated that the MANOVA achieved power of 0.40. Follow-up univariate F-tests identified significant group differences in narcissism, $F(1, 36) = 7.43, p = .01, \eta^2 = .17$, but not Machiavellianism, $F(1, 36) = 3.74, p = .06, \eta^2 = .09$, or psychopathy, $F(1, 36) = 0.06, p = .81, \eta^2 = .002$. A compromise power analysis (one-tailed, effect size $d = 0.5$, beta/alpha ratio = 4, and group 1 $N = 23$ and group 2 $N = 15$) indicated power of 0.59 to detect a medium effect. Mean scores revealed that the world-leading group scored lower on narcissism ($M = 7.57$) in comparison with the world-class group ($M = 10.87$).

Emotional intelligence

A one-way MANOVA with one independent variable was conducted with the four dependent emotional intelligence variables of perception of emotion, management of own emotion, management of others emotion, and utilization of emotion (hypotheses H9, H10, H11, and H12). Variances and covariances were homogenous across the four dependent variables (Levene's and Box's test $p > 0.05$). The results revealed a significant multivariate difference between the world-leading and world-class groups ($F(4, 33) = 3.01, p = .03, \eta^2 = .27, \text{Wilks' } \lambda = .73$), and a large effect size was observed. A compromise power analysis ($N = 38$, groups = 2, and response variables = 4) indicated that the MANOVA achieved power of 0.37. Follow-up univariate F-tests identified significant group differences in perception of emotion, $F(1, 36) = 4.56, p = .04, \eta^2 = .11$, and management others emotion, $F(1, 36) = 11.37, p = .002, \eta^2 = .24$, but not management own emotion, $F(1, 36) = 2.20, p = .15, \eta^2 = .06$, or utilization of emotion, $F(1, 36) = 0.34, p = .56, \eta^2 = .009$. A compromise power analysis (one-tailed, effect size $d = 0.5$, beta/alpha ratio = 4, and group 1 $N = 23$ and

group 2 $N = 15$) indicated power of 0.59 to detect a medium effect. Mean scores revealed that the world-leading group scored higher on perception of emotion ($M = 40.83$) in comparison with the world-class group ($M = 36.40$), and the world-leading group scored higher on management others emotion ($M = 31.52$).

Discussion

Using psychometric questionnaires, this study examined whether Olympic athletes' perceptions of their coaches discriminate between world-leading (i.e., Olympic gold medal winning) and world-class (i.e., Olympic non-gold medal winning) coaches across the Big Five personality traits, the dark triad, and emotional intelligence. Five of the 12 hypotheses were confirmed, with the world-leading coaches being rated higher by their swimmers on the two Big Five traits of conscientiousness and openness to experience, lower on the dark trait of narcissism, and higher on the two emotional intelligence components of perception of emotion and management of others emotion in comparison to the world-class coaches. No differences were found between the groups on the Big Five traits of neuroticism, agreeableness, or extraversion, the dark traits of Machiavellianism or psychopathy, or the emotional intelligence components of management of own emotion or utilization of emotion. It is important to acknowledge the possibility of Type I and II errors. Due to the small sample size, using a standard alpha increases the risk of a Type 1 error, wherein significant differences are reported where none exist. Notwithstanding, due to the substantial loss of statistical power, using a corrected alpha increases the risk of a Type II error, wherein no significant differences are reported when, in reality, differences exist. It is therefore important that the findings are interpreted with these considerations in mind.

In terms of the Big Five traits, the world-leading coaches were perceived by their swimmers to be more conscientious than the world-class coaches, with a large effect size observed. This finding extends previous research which found that successful Olympic and professional coaches scored higher on conscientiousness than standardized population norms (Mallett & Coulter, 2016; Mallett & Lara-Bercial, 2016). It differs, however, from other research that found no differences between world-leading and world-class coaches on self-rated conscientiousness (Cook, Fletcher, Peyrebrune et al., 2021). This discrepancy raises the possibility that some world-leading coaches may actually be more conscientious than they self-report. This effect has been reported in a previous meta-analysis of the incongruence between leader self-reports and follower observer-reports (Lee & Carpenter, 2018). The perceived greater conscientiousness amongst world-leading coaches reflects several beneficial behavioral tendencies that are characteristic of conscientious individuals. Conscientious individuals are typically dutiful and thorough, exerting extra effort and persistence when faced with challenges in ways that will keep swimmers on task and continue to strive for challenging goals. The diligence and discipline perceived by the swimmers will enable the coaches to persist through the many challenges encountered on the road to Olympic success (Mallett & Coulter, 2016). Coaches also act as role models for desirable behaviors (Short & Short, 2005), and as

they attempt to motivate swimmers to exert extra effort, their own goal-striving will encourage swimmers to exhibit similar behaviors. The perception of conscientiousness will therefore be highly advantageous for world-leading coaching.

The world-leading coaches were also perceived by their swimmers to be higher on the Big Five trait of openness to experience in comparison with the world-class coaches, with a medium effect size observed. This contrasts with Cook, Fletcher, Carroll et al.'s (2021) finding of no self-reported differences between world-leading and world-class coaches across the dimension of openness to experience. Although world-leading coaches may not feel more creative in comparison with others, athletes believe that they are. Being perceived as open to new experiences is beneficial for coaching an athlete to win an Olympic gold medal because one of the main characteristics of this trait is divergent thinking (Chernyshenko et al., 2011), which can help coaches attain a competitive advantage. Coaches who are able to challenge traditional practice and communicate an innovative training program to their swimmers are more likely to outperform their rivals. Further, Bono and Judge (2004) found that individuals who score highly on openness to experience also score highly on inspirational motivation, which could help coaches to inspire swimmers to exert more discretionary effort when attempting to complete challenging practices. One can speculate that being perceived as original and being able to create new and challenging practices is advantageous for coaching a swimmer to win an Olympic gold medal.

Turning to the dark triad constructs, the world-leading coaches were perceived by their swimmers to be less narcissistic than the world-class coaches, with a large effect size observed. This is an original observation within the literature because it is first study to psychometrically assess athletes' perceptions of their coaches' dark traits. This finding aligns with previous research which demonstrated that world-leading coaches were lower in self-reported narcissism than world-class coaches (Cook, Fletcher, Peyrebrune et al., 2021). While self-ratings reflect an individual's internal thought processes, observer ratings measure the expressed behavioral tendencies of an individual (Colbert et al., 2012). The difference indicates that the world-class coaches are displaying more grandiose and arrogant dispositions than the world-leading coaches, which may detract from their ability to establish long term coach-athlete relationships, hamper the building of commitment to their vision, and hinder the creation of a positive training environment. The tactics that a coach uses to self-aggrandize and gain the admiration of others, such as aggression, low intimacy strivings, and lack of empathy, may undermine the coach-athlete relationship in the long term. All of these factors appear to impact on coaching effectiveness (Jowett, 2017; Jowett & Shanmugam, 2016) and excessive narcissism will likely hinder a coach's ability to guide an athlete to an Olympic gold medal. Although narcissistic coaches may view themselves favorably, their swimmers may form a different impression.

In relation to emotional intelligence, the finding that the swimmers' perceived world-leading coaches to be higher on perception of emotion than world-class coaches, with a medium effect size observed, extends previous research of Olympic coaches which identified self-perceived attributes

including emotional awareness, perception, and understating (Hodgson et al., 2017; Olusoga et al., 2012). This indicates that not only do coaches internally believe that they can accurately perceive emotion, but that observers externally recognize this through coaches' behavior. It has been suggested that one of the main mechanisms through which coaches' influence performance is by perceiving athletes' emotion (Chan & Mallett, 2011; Potrac et al., 2017). Indeed, if a coach can perceive that a situation is having an adverse emotional impact on an athlete, they can then actively modify the situation to change the emotional response. For example, an athlete may interpret competitive anxiety as having either a facultative or debilitating effect on performance, and coaches who are able to accurately perceive this will then be able to appropriately support performance (Kavussanu et al., 2014). Therefore, being sensitive to athletes needs and emotions will be an advantageous coaching characteristic.

The finding that the world-leading coaches were perceived by their swimmers to be higher on management of others emotion than the world-class coaches, with a large effect size observed, contrasts with coach self-reported management of others emotion where no differences were identified between world-leading and world-class coaches (Cook, Fletcher, Peyrebrune et al., 2021). The swimmers are, however, arguably in a better position to accurately report and perceive whether a coach has understood their thoughts and feelings and, in interpersonal situations, acted appropriately on that understanding to successfully adapt those emotions. Drawing on interpersonal emotion management (Little et al., 2016) and emotion regulation theory (Grandey, 2000), it is suggested that the management of others emotion, combined with the previously noted higher perception of emotion, will enhance a coach's impact and effectiveness. Indeed, world-leading coaches may be able to read when a more subtle combination of positive or negative emotions will influence achievement, and if necessary, help an athlete reappraise a situation for optimal performance (Jones, 1995; Ilies & Judge, 2005). Therefore, being able to regulate athletes' emotional responses will be beneficial for coaching a swimmer to win an Olympic gold medal.

In terms of the non-significant findings, the lack of reported differences between the world-leading and world-class coaches on the Big Five traits of extraversion and neuroticism, the dark trait of psychopathy, and the emotional intelligence component of utilization of emotion aligns with Cook, Fletcher, Carroll et al.'s (2021) findings of world-leading and world-class coaches' self-reported psychological characteristics. However, in contrast with Cook, Fletcher, Peyrebrune et al. (2021), no differences were found between the coaches on the trait of agreeableness. This suggests that in the competitive Olympic environment where getting ahead is valued (Hardy et al., 2017), it may be difficult for swimmers to perceive coaches' internal tendency to get along due to the continual push to enhance performance and beat the competition. The finding that there were no differences between the groups on Machiavellianism contrasts with the world-leading coaches lower self-reported Machiavellianism in comparison with world-class coaches (Cook, Fletcher, Peyrebrune et al., 2021). A possible explanation for this is that the swimmers' trained by world-class coaches may not perceive that they are being manipulated, and instead

may feel that influencing others is part of a coaches' role (Arnold et al., 2018; Cruickshank & Collins, 2015). The lack of difference between the coaches on management of own emotion contrasts with Cook, Fletcher, Carroll et al.'s (2021) finding that world-leading coaches were higher on management of own emotion than world-class coaches. However, it may not be possible for swimmers to identify coaches' management of own emotion because this process is internal and not necessarily observable by others (Petrides et al., 2016).

The results of this study should be interpreted in light of its methodological strengths and limitations. A notable strength of the research is the sample of 38 gold and non-gold medal winning Olympic swimmers, which represents a significant and distinctive sample (Simonton, 2014), and this hard-to-reach population offers novel insights for the disciplines of sport coaching and psychology. Although this study has ascertained that a number of psychological attributes discriminate between world-leading and world-class coaches, a limitation of this research is that it is unclear how these characteristics are expressed, and why they may be associated with coaching an athlete to win an Olympic gold medal. Future research using qualitative methodologies, such as case studies, ethnographies, or narrative inquiry, would therefore help to capture the complexity of the coaching process and would enrich our understanding of the factors that may impact gold medal winning coaching (Sparkes & Smith, 2014). Indeed, exploring other influencing factors, such as the environmental, social, cultural, and organizational aspects, would broaden our understanding of these processes and complexities. In addition, longitudinal designs that examine psychosocial factors over time and across contexts, such as practice, at training camps, and at the Olympic Games, would enable researchers to better understand the stability and long-term patterns of world-leading and world-class coaches' functioning.

The results from this study offer potential implications for applied practice. Previous researchers have emphasized the importance of developing coaches' psychosocial as well technical and tactical competencies (Cook, Fletcher, Carroll et al., 2021; Lefebvre et al., 2016; Maclean & Lorimer, 2016), and integrating the findings of this study into Olympic coach development programs has the potential to enhance coaching practice. There would be value in terms of identifying coaches whose personality profiles suggest they might benefit greatest from inclusion in targeted psychological interventions related to the behavioral expression of maladaptive traits (Laborde et al., 2020). Further, as athletes are aware of coaches' efforts to manage their emotions, development programs should also include behavioral, affective, and cognitive strategies likely to help in the management of swimmers' emotions. Strategies which successfully regulate own emotion are different from those which are successful in the management of others emotion, for example, distraction or expressive suppression may be effective for managing own emotion but not for managing others emotion (Naragon-Gainey et al., 2017). Instead, helping coaches to develop strategies relating to reappraisal or problem solving would be beneficial (Little et al., 2016). Given the importance of athletes' perceptions of coaches' emotions, sporting organizations should integrate emotional labor training into their continued development packages (Hings et al.,

2018). Targeted interventions have been found to enhance emotional labor skills, with evidence indicating the effectiveness of one-to-one coaching and workshops that incorporate written instructions, brief daily exercises, and reflective assignments (Hülshager et al., 2015; Wagstaff et al., 2013).

In conclusion, the purpose of this study was to further our understanding of the psychological factors which discriminate between world-leading and world-class coaches by examining Olympic swimmers' perceptions of their coaches. The results highlighted group differences across the Big Five traits of conscientiousness and openness to experience, the dark triad component of narcissism, and the emotional intelligence constructs of perception of emotion and management of others emotion. This suggests that the psychological characteristics of coaches have an impact on Olympic outcomes, and future researchers should seek to further our understanding of the factors which contribute towards Olympic success.

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ORCID

Gillian M. Cook  <http://orcid.org/0000-0001-5533-2895>
David Fletcher  <http://orcid.org/0000-0002-0556-0360>

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