



Comparing the contribution of conscientiousness, self-control, and grit to key criteria of sport expertise development



Rafael A.B. Tedesqui^{a,*}, Bradley W. Young^b

^a School of Human Kinetics, University of Ottawa, 125 University Private, Montpetit Hall, MNT 416B, Ottawa, Ontario, K1N 6N5, Canada

^b School of Human Kinetics, University of Ottawa, 125 University Private, Montpetit Hall, MNT 226, Ottawa, Ontario, K1N 6N5, Canada

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ABSTRACT

In order to develop expertise, athletes need to amass a high volume of deliberate practice activities over a long period of time. Three personality traits that conceptually relate to long-term goal pursuits and that have been linked to achievement outside sport are conscientiousness, self-control, and grit. This investigation examined how conscientiousness, alone (Study 1) and compared to self-control and grit (Study 2), explained criteria related to sport expertise development. Athletes ($N = 270$, 125 female, $M_{\text{age}} = 21.27$, $SD = 6.91$) ranging in skill level (local to international) completed surveys for personality, deliberate practice (DP), engagement in practice contexts (mandatory and optional), and threats to commitment (thoughts about quitting or switching out of one's sport). In Study 1, broad conscientiousness predicted engagement in both contexts of practice and fewer threats to commitment. At the facet-level, achievement-striving was the best predictor of DP and engagement in practice contexts. No conscientiousness facets predicted threats to commitment or higher skill group membership. In the comparative analyses between facets of conscientiousness, self-control, and grit (Study 2), grit variables performed best: *perseverance of effort* explained deliberate practice and higher skill group membership and *consistency of interests* associated with less thoughts of quitting/switching out of sport. Achievement-striving, dutifulness and self-discipline also showed effects associated with key criteria. These findings suggest, for example, that screening for perseverance of effort may help talent selectors identify which athletes have a personality advantage to persevere through the highly effortful conditions of DP. Other talent identification and development implications are discussed.

To develop sport expertise and reach the highest levels of talent, an athlete needs to apply a great deal of perseverance, discipline, and work ethic towards their sport practice and an enduring commitment to a sport. Much literature on expertise development in sport subscribes to postulates of the deliberate practice (DP) framework (Ericsson, Krampe, & Tesch-Römer, 1993). It contends that, to reach the highest levels, athletes need a long-term engagement in DP, defined as taxing, effortful practice activities designed to improve current performance. Ericsson et al. (1993) considered at least two kinds of limitations to individuals' ability to accumulate great amounts of DP activities. Because of the demanding and effortful nature of DP, Ericsson and colleagues proposed the *effort constraint*, explaining that individuals can sustain DP only for a limited amount of time each day before necessitating appropriate rest and recovery. They also proposed the *motivation constraint*, contending that DP is not inherently motivating per se; instead, individuals' satisfaction would derive from the improvement observed as a result of practice (cf. Hodges & Starkes, 1996). In regards to overcoming these constraints, Ericsson et al. noted that some

individuals might be dispositionally equipped to work hard, suggesting that some athletes might be more motivated to expend extra effort in order to amass more DP activities than others.

According to a review by Baker and Young (2014), sport research has consistently shown that expert athletes accumulate more DP than less-experts at successive points in a career regardless of whether it may take less than 4000 (e.g., field hockey; Baker, Côté, & Abernethy, 2003) or over 18,000 (e.g., gymnastics; Law, Côté, & Ericsson, 2007) hours of DP for athletes to develop expertise. Irrespective of recent disputes over the effect sizes attributed to DP with respect to expertise development (e.g., Ericsson, 2016; Macnamara, Moreau, & Hambrick, 2016), it is generally accepted that expertise development typically involves a long-term engagement in dedicated practice, often characterized by increasing DP in a prioritized sport, as an aspiring athlete progressively shifts from sampling multiple sports/leisure hobbies to commit to one sport (Côté, Baker, & Abernethy, 2003). Although there is much support for these postulates within the sport domain, less research has examined the key personality characteristics that might help athletes

* Corresponding author.

E-mail addresses: rafael.tedesqui@uottawa.ca (R.A.B. Tedesqui), byoung@uottawa.ca (B.W. Young).

amass more DP, that underpin desired striving behaviours toward long-term goal pursuits in sport, and that might explain the practice and commitment advantages of experts.

Research on sport talent identification and development (TID; e.g., Rees et al., 2016) provides a precedent for uncovering personality predictors of sport talent. For example, Gulbin, Oldenzel, Weissensteiner, and Gagné (2010) examined the Australian high performance sporting system and identified two key personality characteristics for TID: an early and enduring passion for the sport and resilience to setbacks. Piedmont, Hill, and Blanco (1999) found conscientiousness to be an important predictor of soccer performance over time, and Toering and Jordet (2015) found that soccer players with higher levels of self-control had greater odds of being chosen for the Norwegian national team. Although such studies make a case for the import of individual difference variables for talent screening purposes, none specifically tested personality variables explicitly in relation to key tenets of an expertise development framework (EDF; e.g., Abernethy, Thomas, & Thomas, 1993; Ericsson & Smith, 1991).

Three personality traits that conceptually relate to long-term goal pursuits and may explain why some athletes accumulate more DP than others are: (a) *conscientiousness*, the tendency to control behaviours in service of personal goals (McCrae & Löckenhoff, 2010); (b) *grit*, the tendency to pursue long-term goals with perseverance and passion (Duckworth, Peterson, Matthews, & Kelly, 2007); and (c) *self-control* (SC), the ability to control thoughts and emotions, and resist temptations in order to perform desired and inhibit undesired behaviours (Tangney, Baumeister, & Boone, 2004). These traits have been consistently linked to achievement in the school, work, and military domains (for meta-analytic reports on grit, SC, and conscientiousness, respectively, see Credé, Tynan, & Harms, 2017; De Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012; Poropat, 2014). Although grit and SC emerged from different bodies of research and are not part of the five broad personality dimensions outlined by McCrae and John (1992), contemporary personality researchers contend that grit and SC share notable conceptual parallels with conscientiousness and thus “should be viewed as part of the family of conscientiousness constructs, if not seen as measuring facets of the [conscientiousness] trait” (Roberts, Lejuez, Krueger, Richards, & Hill, 2014, p. 1319).¹ Still, research outside sport shows they can have different effects, depending on the context or task.

Emerging research suggests that grit (e.g., Tedesqui & Young, 2017b; Larkin, O'Connor, & Williams, 2015) and SC (e.g., Tedesqui & Young, 2017a; Toering & Jordet, 2015) are related to key aspects of athletes' development, including amounts of training and higher skill level. Although conscientiousness predicts performance among soccer players (Piedmont et al., 1999) and distinguishes between athletes and non-athletes (Malinauskas, Dumciene, Mamkus, & Venckunas, 2014), no prior studies have investigated conscientiousness, nor have any contrasted the roles of conscientiousness, grit, and SC, within an EDF (e.g., Abernethy et al., 1993; Ericsson & Smith, 1991). To gauge the applicability of a variable of interest (i.e., personality traits) within an EDF, the DP (Ericsson et al., 1993) and the expert performance (Abernethy et al., 1993; Ericsson & Smith, 1991) frameworks, as well as a consequent body of research on sport expertise development (for a review, see Baker & Young, 2014) suggest that it is first necessary to assess whether

¹ Although self-control has been studied as a psychological construct independently of conscientiousness (e.g., Muraven & Baumeister, 2000), personality psychologists consider self-control to be a primary facet of conscientiousness (e.g., Roberts et al., 2014; Tangney et al., 2004). Thus, within the personality literature, “as it is typically conceived and measured, self-control should be viewed as lying within the domain of conscientiousness” (Roberts et al., 2014, p. 1320). Similarly, Duckworth et al. (2007) defined grit as a trait and a personal quality, specifically contrasting its predictive ability against that of conscientiousness and self-control, indicating their preference that grit be equally construed as a personality variable.

a trait is associated with athletes' weekly amount of DP (e.g., Ward, Hodges, Starkes, & Williams, 2007) as well as its association with engagement in mandatory and optional practice contexts (e.g., Tedesqui & Young, 2017a). Further, it is important to determine whether a trait is associated with measures of athletes' commitment, or inversely, thwarts threats to one's sport commitment. Finally, it is critical to know whether a trait can distinguish between more and less-skilled groups (Abernethy et al., 1993; Baker, Wattie, & Schorer, 2015).

Thus, the current investigation aimed to examine the associations of conscientiousness, grit, and SC with criterion measures for (a) engagement in various practice contexts (including DP) and (b) commitment-related measures, as well as how (c) these traits could discriminate escalating skill groups in sport. In Study 1, we began by examining conscientiousness alone. In Study 2, informed by results from Study 1, we advanced key facets of conscientiousness to further analyses wherein their relative contribution could be contrasted with contributions from key facets of grit and SC. Overall, we sought to systematically identify the best personality predictors (in combination, and the best alone) of criteria associated with athletes' expertise development. Our decision to present two consecutive studies was guided by a parsimonious approach (i.e., selecting the fewest predictors that could explain the maximal amount of variance; Paulhus, Robins, Trzesniewski, & Tracy, 2004) for two reasons. From a research perspective, parsimony helps avoid the risk of artificially inflating amounts of explained variance, which happens when too many variables are arbitrarily included as predictors. From an applied standpoint, it allows one to determine measures for TID screening that are most relevant.

1. Study 1

Conscientiousness is one of five broad personality dimensions in the five-factor model (McCrae & John, 1992). It comprises six facets: (a) competence, the degree to which individuals are effective, efficient, and prepared; (b) order, a preference for neatness, organization, and structure; (c) dutifulness, the tendency to be governed by rules and to adhere to principles; (d) achievement striving (AS), the tendency to set more challenging goals and to work harder to accomplish them; (e) self-discipline, the ability to begin and complete tasks despite boredom and distractions; and (f) deliberation, the tendency to interpose thought before an impulse to act (McCrae & Löckenhoff, 2010). Conscientiousness has been consistently linked to academic and job achievement (e.g., Poropat, 2014). It also distinguished between athletes and non-athletes (Malinauskas et al., 2014), and was associated with gymnasts' quality of preparation (Woodman, Zourbanos, Hardy, Beattie, & McQuillan, 2010) and with soccer performance (Piedmont et al., 1999). In these studies, conscientiousness was assessed at the broad, but not at the facet level. However, research is needed to examine conscientiousness facets, particularly because predictive validity tends to increase when lower-order facets are assessed (Paunonen & Ashton, 2001).

Conscientiousness has yet to be examined in the context of sport expertise development in a detailed and systematic manner at the facet level. This research is needed, especially considering that the six facets have curious parallels to how athletes may direct effort to DP (Ericsson et al., 1993; Tedesqui & Young, 2015). For example, athletes lower in self-discipline may be less likely to complete required amounts of DP during the off-season, when there is less structure to their training, less obligations to others (e.g., coach), and more distractions. Those higher in deliberation might be better able to inhibit impulses that tempt them to skip effortful practice sessions. Therefore, the purpose of Study 1 was to test whether conscientiousness (both broad and facets) was associated with athletes' weekly amounts of DP, engagement in different practice contexts, and threats to commitment; and whether it predicted skill-group membership.

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