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Attribute-based Selection for Success: The Role of Personality Attributes in Long-term Predictions of Achievement in Sport

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Abstract

The predictive utility of personal attributes for high-stake selection was examined in a case of athletic achievement in Australian rules football. A group of 32 elite junior players from a leading Australian Football League (AFL) club were assessed with the Sixteen Personality Factors Inventory (Form A; Cattell, Eber & Tatsuoka, 1970) at the peak of their junior playing career. Seven years later, 13 players from this junior sample had made it into senior AFL competition, whereas 19 others ended up playing minor leagues or dropped out. The two groups did not differ on primary personality factors, nor on coach ratings of their performance as juniors. However, when the players' physical potential rated by their junior coach was controlled for in a MANCOVA, the differences between the groups became highly significant: both on multivariate estimates ($F(16, 14) = 3.51$; $p = .012$) and on a number of individual factors. Consequently, personality factors produced a more accurate prediction of the junior players' transition to senior AFL (84.2% players correctly classified as successful transition makers vs drop-outs in a discriminant function analysis) than did the combined coach ratings of the players' performance and potential shown in juniors (59.4% accuracy). Moreover, when personality factors were combined with only one of the coach ratings – that of players' physical potential – the same prediction achieved a perfect 100% accuracy. Regression analyses further revealed that predictions from personality measures were much more accurate for longer-term outcomes: they explained just over 11% variance in the coach ratings of player performance in the junior championship, but nearly 61% of variance in the aggregate performance ratings over five seasons in the seniors competition, and 99% of variance in the coach ratings on the construct "struggling – cruising through senior 3 ranks". The results support the mediating role of personality in converting ability into achievement. In practical terms, they confirm the utility of combining estimates of physical ability with personality profiling in predicting the likelihood of success in junior players' transition to seniors competition.

Keywords: Personality, Athletic Achievement, Australian Rules Football, Longitudinal Study
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Author notes

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Introduction

Predicting the likelihood of success in a promising junior's transition into an accomplished senior performer is every recruiter's dream – whether it is sports scouting (Blanksby, Bloomfield, Ackland, Elliott, & Morton, 1994; Singer, Hausenblas, & Janelle, 2001); military training (Aidman, Galanis et al., 2002) or talent hunting in the human resource industry (Raymark & Schmit, 1997). Personality attributes feature quite prominently among the candidate predictors of such transition – largely based on the growing evidence of the role personality plays in a range of important life outcomes such as academic achievement (Ferguson, Sanders, O'Hehir & James, 2000; Zuckerman, Miyake, Osborne & Koestner, 1991), vocational choice and work-related behaviour (Raymark & Schmit, 1997; Robertson et al., 2000), as well as sport and exercise-related behaviour (Aidman & Schofield, 2004; Auweele et al., 2001; Silva, 1984; Vealey, 1992). Personality constructs have been instrumental in refining the models of the connection between ability and achievement in most of these fields.

In sport psychology, predicting athletic achievement from personality characteristics has long been considered one of the most attractive applications (cf. Apitzsch, 1995; Cooper, 1969; Deary & Matthews, 1993; Diamant, Byrd & Himelein,

1991; Eysenck, 1995; Greenberg & Greenberg, 1992; Liwei & Leahy, 1993). A wide variation of personality traits have been found to be associated with levels of achievement (Davies & Mogk, 1994; Kirkcaldy, 1982; Morgan, 1979) in a number of sports, including basketball (Evans & Quarterman, 1983), hockey (Williams & Parkin, 1980), American football (Daus, Wilson & Freeman, 1986; Kroll & Petersen, 1965; Kroll & Crenshaw, 1968; Schurr, Ruble, Nisbet & Wallace, 1984), mountaineering (Magni et al., 1985), rowing (Morgan & Johnson, 1978) and other endurance sports (Egloff & Jan Gruhn, 1996; Morgan et al., 1988). However, the specific personality predictors found in earlier research, vary so dramatically from study to study, that they make generalisations next to impossible (Auweele et al., 2001). Not surprisingly, the debate between the "sceptical" and the "credulous" views on personality and sport (Morgan, 1980) continues, despite substantial progress towards its resolution (cf., Rowley, Landers, Kyllo & Etner, 1995; Singer, Hausenblas, & Janelle, 2001). Is personality really so irrelevant in sport, as suggested by the sceptics? Or has the earlier research just been unable to effectively detect its influence, as would be argued from a "credulous" point of view?

The widely acknowledged lack of methodological and conceptual rigour in "sports personology" (cf. Vealey, 1989, 1992) seems to confirm the latter suggestion. In particular, sport psychologists' brave but often simplistic pursuit of personality seems to have largely ignored the fundamental developments in mainstream personality research. The two most commonly overlooked principles are (a) the long-term nature of personality influences (Hogan, 1998; Hogan, DeSoto & Solano, 1977; Hogan & Shelton, 1998; Pervin, 1996) and (b) their moderating - rather than direct - effects in predicting outcomes of importance, such as job performance (Barrick & Mount, 1991) and educational attainment (c/f., Zuckerman, Miyake, Osborne & Koestner, 1991). Regarding the first principle, personality does matter when critical long-term issues such as career prospects (c/f., Hogan, 1998; Hogan & Shelton, 1998) or health risks (Eysenck, 1995) are at stake. This fundamental influence is also likely to reveal itself if the personality-performance relationship is examined in the context of the life-span (cf., Vealey, 1992). However, any serious life-span operationalisation of personality influences on sport behaviour requires rigorous application of expensive longitudinal methodology. Longitudinal studies remain rare in sport psychology despite having been

repeatedly called for (cf., Morris, 1995), while the cross-sectional approach remains dominant – albeit less than convincing.

Second, the latter principle explains why the majority of reported direct personality effects on athletic performance are so small – in fact, it is surprising that there is any effect at all. Personality is known as a source of moderator variables (Singer, Hausenblas, & Janelle, 2001), and the search for their effects in sport has largely been misplaced. Personality variables are more likely to appear in interaction – rather than direct – effects, such as influencing the likelihood of converting one's ability into achievements (Barrick & Mount, 1991). In other words, personality makes a difference when other factors, such as ability, are controlled for. For example, no amount of mental toughness and emotional stability can help someone with a small body frame to become a rugby or basketball star, or someone with limited lung capacity to make it onto an Olympic rowing crew or swimming squad. Some remarkable exceptions from this rule are well known (e.g., NBA star Tyrone "Muggsy" Bogues was only 1.60 m tall). What is most interesting about such exceptions is that they are almost always attributable to personality. On the other hand, for two athletes of similar ability (e.g., having the same "physical potential"), personality is what is likely to make a difference in their ultimate sporting achievements. For example, there is growing evidence suggesting that emotional stability is associated with athletic success (Garfield & Bennett, 1984; Singer, 1986, 1988; Terry, 1995; Williams, 1986). Athletes with lower levels of emotional stability have been found to be less capable of coping with stress-inducing stimuli whilst trying to complete a complex motor task (Brown & Shaw, 1975). Extending these experimental findings, higher levels of competitive stress were found to be associated with greater performance deficits in athletes with lower levels of emotional stability (Williams, 1986). These findings suggest that emotional stability is particularly important in close contests and, as a dispositional trait it is likely to have an impact on the athlete's progress in their sport. It is also well established that conscientiousness plays an important role in predicting vocational success in a range of occupations (Raymark & Schmit, 1997; Robertson et al., 2001). Facets of this Big Five trait have been associated with performance consistency (Aidman & Bekerman, 2001; Piedmont, Hill, & Blanco, 1999)

and longevity in sport (Veale, 1992), and it was therefore included as a candidate predictor in the study below.

In order to test these general principles (long term and interaction effects), as well as the utility of the candidate predictors identified above, the present study examined both long-term and moderating effects of personality on athletic achievement among Australian Rules football players. A group of elite junior players with a leading Australian Football League (AFL) club were profiled at the peak of their junior playing career – immediately after the season when they won the National Championship in their age group. The same players were followed up seven years later with an assessment of their progress in the sport. Personality variables were hypothesised to have no direct effect on whether or not the player makes it to the senior league, but the effect was expected to become significant when controlling for their relative physical ability shown in juniors. Further, personality variables were hypothesised to have only weak associations with players' performance as junior champions (at the time of initial profiling), but to produce strong longitudinal effects on several achievement measures in the ensuing seven years as senior players.

Method

Participants. A highly successful junior squad of 32 Australian Rules football players aged 16-19 (mean age 17.8; SD = 1.1) participated as part of their post-season evaluation which included medical, skill and psychological assessment. The players were informed that the assessment was part of the club's selection process into its senior squad.

Materials and Procedure. The players completed the 16 Personality Factors inventory (16PF; 4th edition, form A – Cattell, Eber & Tatsuoka, 1970). Primary 16PF factors, such as emotional stability, conscientiousness or group orientation, are accepted as standard-setting in terms of their reliability and other psychometric properties. Players' individual performance in the preceding season was rated by their head coach and a club manager in charge of the squad, on a 5-point Likert scale from 1 (poor overall performance) through 5 (excellent performance). Inter-rater agreement between the coach and manager was acceptable (Cohen's Kappa = .28, p <.05), thus these ratings were averaged for all subsequent analyses. The coach also evaluated the players' potential

shown during the season, using the same Likert scale format from 1 (poor) through 5 (excellent) to rate players' individual "skill and physical ability", "personality" and "motivation" (the latter two ratings formed a reliable aggregation with Chronbach's alpha = .76).

Seven years later, the same players were followed up with the intention to evaluate their progress in the sport. The first, and most fundamental of the follow-up questions was whether or not the player had made it to senior AFL. Answers to this question provided by the same coach (who was now coaching at the highest senior AFL level) were verified against official AFL records. The coach was also asked to examine his former supervisees' performance over the preceding five seasons and rate it separately for each year (years 3 through 7 of the longitude) on a Likert scale format from 1 (poor) through 5 (excellent). Finally, the coach rated the players' progress through senior AFL ranks, their achievement against senior AFL standards on the same 5-point Likert scale format, and how well they were coping with the senior competition from 1 ("struggling") to 5 ("cruising"). All coach ratings, except the last one, were aggregated into a composite construct "performance in seniors" which was highly reliable on the current sample (Cronbach's alpha = .96).

Results

Validity check. Despite the context of "examination" at the time of initial profiling, no excessive impression management tendencies were observed. In fact, both "faking good" (mean raw score 6.13; SD= 3.08) and "faking bad" (mean raw score 3.47; SD=2.44) scores were surprisingly close to the test norms (6.06 $\pm$ 2.35 and 2.82 $\pm$ 2.16 respectively) reported by Cattell, Eber and Tatsuoka (1970), indicating that the data can be regarded as a valid representation of the players' personality dispositions.

Elite AFL junior profile. As can be seen in Table 1 and Fig.1, the mean sten scores for the sample are significantly different from the respective age norms on a number of primary factors. In particular, the players reported being more sociable (A+) and group oriented (Q2–), more confident (O –), enthusiastic (F+), socially bold (H+) and emotionally stable (C+) but less driven (Q4 –) and trusting (L –) than their age peers from the normative population.

Table 1. Average 16PF primary factor sten scores for the entire elite junior football player sample (N=32).

Primary 16PF Factors	Elite junior football players (N=32)		Differences from general populaiton	Effect size: Glass' estimate
	Mean	SD	One-sample *t*	*Δ*
A	7.06	1.95	4.38***	0.78
B	4.91	2.31	-2.01	0.29
C	6.74	1.96	4.19***	0.62
E	5.35	2.58	-0.61	0.07
F	6.91	1.85	5.21***	0.71
G	6.03	1.78	1.92	0.26
H	7.00	2.17	3.93***	0.75
I	5.88	1.59	1.41	0.19
L	4.53	2.15	-3.35**	0.49
M	5.09	1.86	-1.02	0.21
N	5.21	2.35	-1.06	0.15
O	4.62	1.95	-3.07**	0.44
Q1	5.68	2.42	0.07	0.09
Q2	4.79	1.47	-3.28**	0.35
Q3	6.53	2	2.68*	0.51
Q4	4.71	2.22	-2.24*	0.40

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

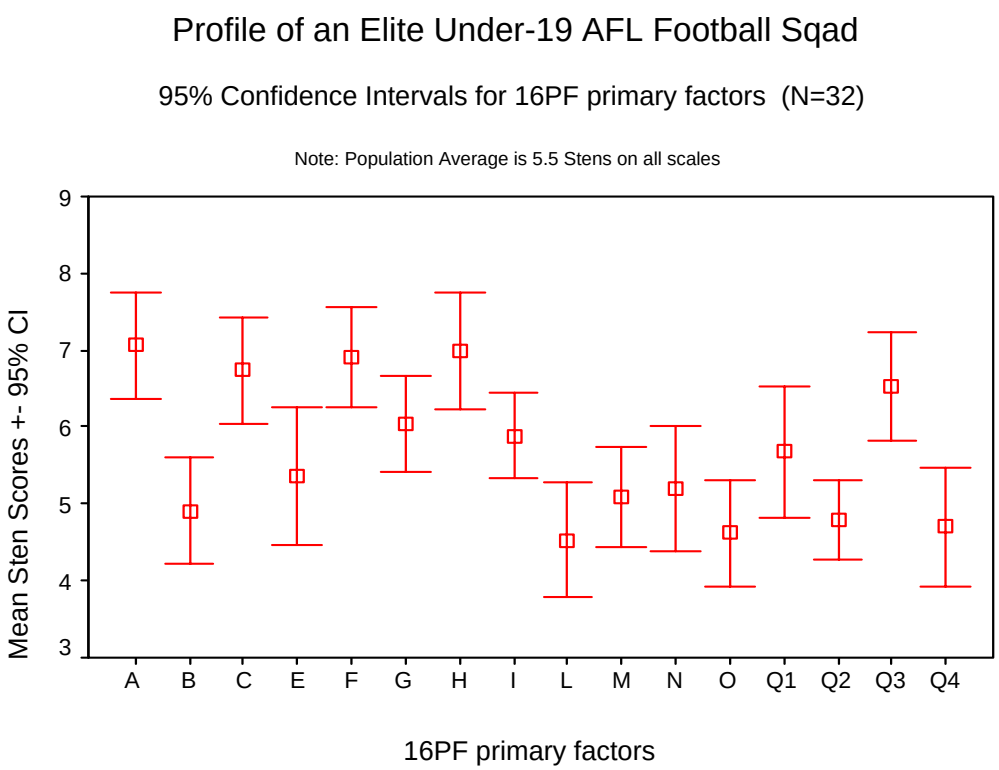


Figure 1. Averaged junior AFL player profile
(note: population mean for each of the factors is 5.5)

Transition from juniors to seniors. Out of the sample's 32 junior players, 13 players made it into senior AFL competition, whereas 19 others ended up playing minor leagues or dropped out of the game altogether. The differences between the two groups (those who made it to AFL and those who did not) on raw 16PF primary factor scores were examined with a MANCOVA, with the coach ratings of the players' physical potential (shown in juniors) as a covariate. MANOVA showed no significant differences between the groups: multivariate F (16, 14) = 1.18 (p = .39). However, when the players' physical potential rated by their junior coach was controlled for in a MANCOVA, the differences between the groups became highly significant, both on multivariate estimates (F (16, 14) = 3.506; p = .012) and on a number of individual factors. As can be seen in Table 2, the players who made a successful transition to seniors had reported less tension on factor Q4, stronger group orientation on factor Q2, preference for less radical / more

traditional views on factor Q1 and tended to report greater conscientiousness on factor G, than their team-mates who did not make it to the senior AFL competition.

Table 2. Personality differences between junior football players who made a transition to seniors and those who did not

	did not make it to senior AFL		Successful transition to senior AFL		MANCOVA differences
	Mean	SD	Mean	SD	*p*
G: conscientiousness	11.74	2.86	13.38	3.20	.08
Q1: radicalism	10.16	3.72	8.00	3.58	.018
Q2: group orientation	8.84	2.03	6.92	2.29	.003
Q4: drive / tension	12.53	5.65	9.23	2.71	.048

Note: Included are only those 16PF raw primary factor scores that showed significant (or near-significant) differences between the two groups, controlling for players' physical potential rated by their junior coach.

As can be seen in Table 3, discriminant function analyses showed that all coach ratings of junior players' ability, performance and potential (physical, personality and motivation) combined to produce a poor prediction of their transition into senior AFL ranks (59.4% players correctly classified as successful transition makers vs drop-outs).

Table 3. Discriminant function analysis: Predicting Senior AFL Membership from coach ratings of junior players' performance AND physical, personality and motivation potential

	Predicted Group Membership		
Actual Group	did not make it to senior AFL	made it to senior AFL	Total
Did not make it to senior AFL	15 (78.9%)	4 (21.1%)	19 (100%)
Made it to senior AFL	9 (69.2%)	4 (30.8%)	13 (100%)

Note: 59.4% of original grouped cases correctly classified.
Prior probability was set on the basis of actual frequencies.

This accuracy is not much better than random prediction obtainable by flipping a coin. However, when the same prediction was made purely on the basis of four 16PF primary factors identified earlier in the MANCOVA (G, Q1, Q2 and Q4), the accuracy increased to 84.4% (see Table 4).

Table 4. Classification Results: Predicting Senior AFL Membership from 16PF primary factors only

	Predicted Group Membership		
Actual Group	did not make it to senior AFL	made it to senior AFL	Total
Did not make it to senior AFL	16 (87.2)	3 (15.8)	19 (100%)
Made it to senior AFL	2 (15.4)	11 (84.6)	13 (100%)

Note: 84.4% of original grouped cases correctly classified.
Prior probability was set on the basis of actual frequencies.

Moreover, when the same set of four 16PF primary factors was combined with just one coach rating – that of the players' physical potential – a perfect 100% accuracy was achieved for the same prediction (see Table 5 and Fig. 2).

Table 5. Classification Results: Predicting AFL Membership from 16PF and coach ratings of the player's physical potential

	Predicted Group Membership		
Actual Group	did not make it to senior AFL	made it to senior AFL	Total
Did not make it to senior AFL	19 (100%)	0 (0%)	19 (100%)

Made it to senior AFL	0 (0%)	13 (100%)	13 (100%)

Note: 100.0% of original grouped cases correctly classified.
Prior probability was set on the basis of actual frequencies.

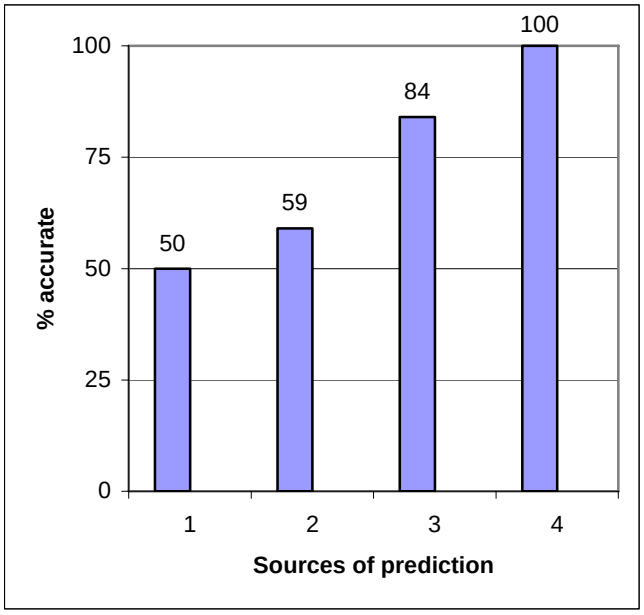
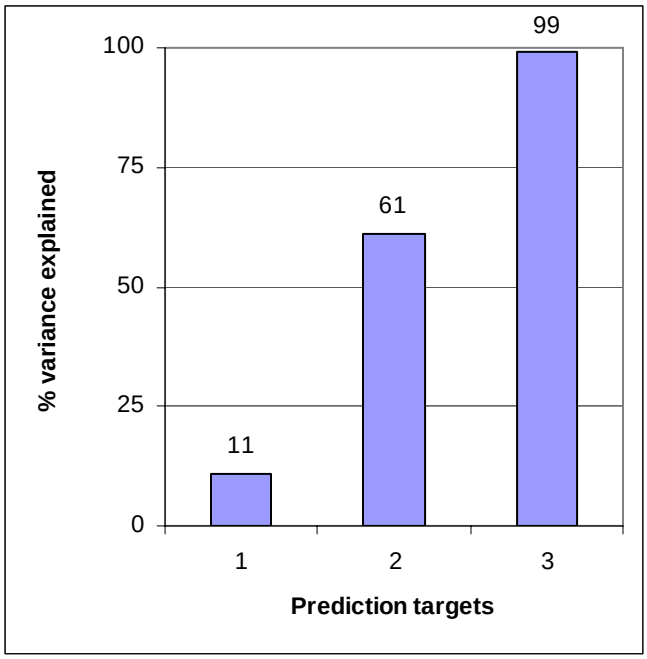


Fig. 2. Predicting whether or not junior champions make it to senior football league.
Sources of prediction:
1=flipping a coin;
2= coach ratings of ability and performance as juniors;
3=personality profile;
4= personality profile combined with ability ratings by coach

Personality and performance: immediate vs long-term prediction. The coach ratings of the players' performance as junior champions (at the time of initial personality assessment) were regressed on their 16PF primary factor scores obtained at the end of their championship season. The resulting prediction model included only one factor (factor M – abstractedness), was barely significant ($F = 4.89$; $p = .035$) and explained only 11.2% of variance in the junior performance ratings (as can be seen in Fig. 3 adjusted R^2 =.112).



Fugure 3. Predicting senior AFL performance from primary 16PF factors .
Prediction targets:

1. performance in junior championship at the time of testing
2. aggregate of senior achievement over the last 5 seasons (Alpha=.96)
3. coach rating on a 5-point scale: "struggling vs cruising through senior AFL ranks"

On the other hand, when a global estimate of "achievement at seniors" (as was mentioned in Method, this composite construct was aggregated from performance ratings over 5 different seasons and ratings of progress and achievement, with Cronbach's alpha of .96 for the aggregate) was similarly regressed on the same 16PF primary factors, the prediction model became substantially more powerful and conceptually meaningful. As shown in Figure 3, it explained nearly 61% of variance in the ratings (adjusted R^2 =.608) with the two significant predictors being Q2 (group-orientation) and C (emotional stability).

Further, coach ratings on the construct "struggling – cruising through senior AFL ranks" were almost perfectly predicted (adjusted R^2 =.993) from the same 16PF scores. The reliability of this prediction's criterion is, strictly speaking, unknown. However, its face validity – coupled with the remarkable accuracy of the prediction itself – makes the

overall pattern of the last three predictions quite meaningful and compelling (see Figure 3).

Discussion

How important is an account of personality factors in distinguishing between elite junior players and their age peers? Are those junior players who make it through to seniors substantially different from those who don't? The results demonstrated significant personality differences between elite junior AFL players and their age peers, but more importantly – between those juniors who made a successful transition to senior AFL over a seven year period and those who did not. It is important to view these two sets of individual differences in combination.

Transition from juniors to seniors: converting ability into achievement. One of the key questions in any long-term prediction of athletic achievement is whether or not a successful junior athlete makes a successful transition into seniors competition. Decisions about senior club coaching, management and – particularly – selection are bound to rely on answers to such questions. There does not seem to be a more important task for both coaches and managers of junior club squads than to develop ways of identifying those junior players who are likely to successfully make it through to senior ranks. So it would be natural to expect the coach and other experts involved with champion junior squads to make reasonably accurate judgements – even if based on intuition – of the players' potential to make it to the seniors' competition. After all, these experts had no less than a year to closely observe their players, and to make conclusions about their potential, including physical ability, personality and motivation (commitment). Yet, our results show that these judgements were not as accurate as would have been expected. Neither of the expert ratings of physical, personality or motivation potential, nor the performance ratings in the junior season, showed any hope of predicting the key long term outcome for these young players - whether or not they made it through to seniors.

The results suggest that the same fundamental prediction can be made with far greater accuracy from a set of objective personality measures, such as 16PF profile. Furthermore, the conceptual model "personality as a means of converting ability into achievement" suggests that a combination of personality measures with estimates of ability may provide an even better prediction of achievement. Based on this suggestion,

the prediction model was expanded to include just one of the expert ratings – that of physical potential (ability). This combined model produced dramatically improved accuracy in predicting the success of junior player transition into seniors. Note that ability ratings in themselves did not differentiate between the groups – but they added to the differentiating power of personality factors. The implications of this series of discriminant function predictions, together with the MANCOVA results, are quite profound. Conceptually, these results are consistent with the notion of personality as a key factor in converting ability into achievement (Auweele et al., 2001): at any given level of ability, personality is likely to determine the style and degree of application of this ability and thus – the ultimate achievement. At the level of practical application, these results provide a confirmation of the utility of combining (physical) ability estimates with objective personality profiling in predicting the likelihood of success in junior athletes' transition into senior ranks.

Predicting achievement from personality: short-sightedness fails, the big picture succeeds. The attempt to predict the players' performance as junior champions from their 16PF primary factor scores obtained at the end of their championship season, was unimpressive. The model was barely significant and explained only just over 11% of variance in junior performance ratings. Cattell's factor M as the sole significant predictor indicated that the better performers in the champion junior squad were likely to be slightly more abstracted and idea-oriented. Given that, strictly speaking, this model should be regarded as a post-diction (rather than pre-diction) – personality measures taken after the target performance – it appears to be little more than idiosyncratic, and thus hardly worth generalising. By contrast, longer-term predictions from the same personality measures were much more accurate. In particular, they explained nearly 61% of variance in the aggregate ratings of player performance over five seasons in the seniors competition, and over 99% of variance in the coach ratings on the construct "struggling – cruising through senior AFL ranks". The two most significant contributions to these predictions were primary factors Q2 (group-orientation) and C (emotional stability), which is consistent with previous findings (Auweele et al., 2001; Brown & Shaw, 1975; Garfield & Bennett, 1984; Singer, 1988).

The step-wise regression utilised in this analysis had its limitations. A more conceptually informed hierarchical regression would have been preferable but would have had to have been based on more substantive theorising about which particular primary 16PF factor – or any other personality variable for that matter – is a better long-term predictor of athletic performance in a particular sport. The point to be made here is that, consistent with existing literature, personality variables in this study were far better suited for long-term overall (global) achievement predictions than for immediate performance estimates.

Finally, the findings of this study may be interpreted beyond the domain of sports achievement. Note that the utility of personality constructs in selection assessments have mostly rested on their capacity to refine the models of the connection between ability and achievement (cf., Robertson et al., 2000). Personality was never intended to replace estimates of ability in the predictions of task performance and long-term achievement. Our findings seem consistent with the argument that emerges from the literature on selection and talent identification (Raymark & Schmit, 1997; Robertson et al., 2000; Tenenbaum & Bar-Eli, 1995): ability – whether cognitive (e.g., IQ) or physical (e.g., body frame or fast muscle fibre count) – remains an important, "entry ticket"-like factor in determining the individual's potential to achieve, whereas personality factors influence the extent to which the "above-the-entry-level" abilities convert into high-level performance. In that sense, our results could be generalised as adding confidence to the broader conclusion that it is personality that makes the difference between "the best" and "the rest" in just about any field of human endeavour.

References

Aidman, E., Galanis, G., Manton, J., Vozzo, A., & Bonner, M. (2002). Evaluating Human Systems in Military Training. *Australian Journal of Psychology*, **54** (3), 168-173.

Aidman, E.V. & Bekerman, M. (2001). Predicting achievement and performance in Australian rules football: the role of self-concept, emotional stability, achievement orientation and stress appraisal. In: Papioannou A., Goudas M. & Theodorakis Y. (Eds.) *In the dawn of the new millennium. Proceedings of the 10th World Congress of Sport Psychology*. (pp. 361 - 363). Thessaloniki: Christodoulidi Publications.

Aidman, E.V., & Schofield, G. (2004). Personality and Individual Differences in Sport. In T. Morris & J. Summers (Eds.), *Sport Psychology: Theory, Applications and Issues* (2nd Ed.) (pp. 22-47). Milton: Wiley.

Apitzsch, E. (1995). Psychodynamic theory of personality and sport performance. In S.J.H. Biddle (Ed.), *European perspectives on exercise and sport psychology (*pp. 111-127). United Kingdom: Human Kinetics.

Van Auweele, Y., Nys, K., Rzewnicki, R., & van Mele, V. (2001). Personality and the Athlete. In: Singer, R. N., Hausenblas, H. A., & Janelle, C. M. (Eds.). *Handbook of sport psychology* (2nd ed.) (pp.239-268). New York: Wiley.

Barrick, M.R., & Mount, M.K. (1991). The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology, 44*, 1-26.

Blanksby, B. A., Bloomfield, J., Ackland, T. R., Elliott, B. C., & Morton, A. R. (1994). *Athletics, growth, and development in children: The University of Western Australia Study*: (1994). xii, 287pp.

Cattell, R.B., Eber, H.W., & Tatsuoka, M. (1970). Handbook for the sixteen personality factor questionnaire. Champaign, IL: Institute of Personality and Ability Testing.

Cooper, L. (1969). Athletics, activity and personality: A review of the literature. *Research Quarterly, 40*, 17-22.

Davis, C., & Mogk, J.P. (1994). Some personality correlates of interest and excellence in sport. *International Journal of Sport Psychology, 25*, 131-143.

Deary, I.J., & Matthews, G. (1993). Personality traits are alive and well. *The Psychologist, 6*, 299-311.

Diamant, L., Byrd, J.H., & Himelein, M.J. (1991). Personality traits and athletic performance. In L. Diamant (Ed.), *Mind-body maturity: Psychological approaches to sports, exercise, and fitness* (pp. 227-236). New York: Hemisphere Publishing Corporation.

Digman, J.M. (1997). Higher-order factors of the big five. *Journal of Personality and Social Psychology, 73*(6), 1246-1256.

Egloff, B., & Jan Gruhn, A. (1996). Personality and endurance sports. *Personality and Individual Differences, 21*(2), 223-229.

Evans, V., & Quarterman, J. (1983). Personality characteristics of successful and unsuccessful black female basketball players. *International Journal of Sport Psychology, 14*, 105-115.

Eysenck, H.J. (1995). Science and psychology of sport – the place of personality theory. *Sportonomics, 1*(1), 3-9.

Eysenck, H.J., Nias, D.K., & Cox, D.N. (1982). Sport and personality. *Advances in Behaviour Research and Therapy, 4*(1), 1-56.

Ferguson, E., Sanders, A., O'Hehir, F., & James, D. (2000). Predictive validity of personal statements and the role of the five-factor model of personality in relation to medical training. *Journal of Occupational and Organizational Psychology, 73*(3), 321-344.

Fisher, A.C., Horsfall, J.S., & Morris, H.H. (1977). Sport personality assessment: A methodological reexamination. *International Journal of Sport Psychology, 8*(2), 92-102.

Fiske, D.W. (1988). From inferred personalities toward personality in action. *Journal of Personality, 56*, 815-833.

Franken, R.E., Hill, R., Kierstad, J. (1994). Sport interest as predicted by the personality measures of competitiveness, mastery, instrumentality, expressivity, and sensation-seeking. *Personality and Individual Differences, 17* (4), 467-476.

Hardman, K. (1973). A dual approach to the study of personality and performance in sport. In H.T.A. Whiting, K. Hardman, L.B. Hendry, & M.G. Jones (Eds.), *Personality and performance in physical education and sport.* London: Kimpton.

Heron, E., Furst, D., & Rotstein, P. (1986). Personality of athletes participating in various sports. *International Journal of Sport Psychology, 17*, 120-135.

Hogan, R., (1998) Reinventing personality. *Journal of Social and Clinical Psychology, 17*(1), 1-10.

Hogan, R., DeSoto, C.B., & Solano, C. (1977). Traits, tests, and personality research. *American Psychologist, 32*, 255-264.

Hogan, R., & Shelton, D. (1998) A socioanalytic perspective on job performance. *Human Performance, 11*(2-3), 129-144.

Kirkcaldy, B.D. (1982). Personality profiles at various levels of athletic participation. *Personality and Individual Differences, 3*, 321-326.

Liwei, Z., & Leahy, T. (1993). Athlete personality evaluation and its application. *Sports Excellence, Nov*, 17-23.

Magni, G., Rupolo, G., Simini, G., De Leo, D., & Rampazzo, M. (1985). Aspects of the psychology and personality of high altitude mountain climbers. *International Journal of Sport Psychology, 16*, 12-19.

Martin, J.J., & Gill, D.L. (1991). The relationships among competitive orientation, sport-confidence and self efficacy, anxiety and performance. *Journal of Sport & Exercise Psychology, 13*, 149-159.

Miller, B.P., & Miller, A.J. (1985). Psychological correlates of success in elite sportswomen. *International Journal of Sport Psychology, 16*, 289-295.

Molloy, G.N. (1979). Some personality characteristics of Australian male and female athletes. *Australian Journal of Sports Medicine, Apr/May/June*, 33-36.

Morgan, W.P. (1979). Prediction of performance in athletics. In P. Klavora & J.V. Daniel (Eds.), *Coach, athlete, and the sport psychologist* (pp. 173-186). Toronto: University of Toronto.

Morgan, W.P. (1980). The trait psychology controversy. *The Research Quarterly for Exercise and Sport, 51*, 50-76.

Morgan, W.P., Costill, D.L., Flynn, M.G., Raglin, J.S., & O'Connor, P.J. (1988). Mood disturbance following increased training in swimmers. *Medicine and Science in Sports and Exercise, 20*(4), 408-414.

Morgan, W.P., & Johnson, R.W. (1978). Personality characteristics of successful and unsuccessful oarsmen. *International Journal of Sport Psychology, 9*, 119-133.

Morgan, W.P., O'Connor, P.J., Ellickson, K.A., & Bradley, P.W. (1988). Personality structure, mood states, and performance in elite distance runners. *International Journal of Sport Psychology, 19*, 247-263.

Morris, T. (1995). Psychological characteristics and sports behaviour. In T. Morris & J. Summers (Eds.), *Sport psychology: theory, applications and issues* (pp. 3-27), Milton: John Wiley & Sons.

Peterson, S.L., & Weber, J.C., & Trousdale, W.N. (1967). Personality traits of women in team versus women in individual sports. *Research Quarterly For Exercice and Sport, 4*, 686-689.

Piedmont, R. L., Hill, D. C., & Blanco, S. (1999). Predicting athletic performance using the five-factor model of personality. *Personality and Individual Differences, 27(4) 769-777*.

Raymark, P.H., & Schmit , M.J. (1997). Identifying potentially useful personality constructs for employee selection. *Personnel Psychology, 50*(3), 723-737.

Renger, R. (1993). A review of the profile of mood states (POMS) in the prediction of athletic success. *Journal of Applied Sport Psychology, 5*, 78-84.

Robertson, I.T., Baron, H., Gibbons, P., MacIvor, R., & Nyfield, G. (2000). Conscientiousness and managerial performance. *Journal of Occupational & Organizational Psychology, 73 (2)*, 171-181.

Rowley, A.J., Landers, D.M., Kyllo, B., & Etner, J.L. (1995). Does the iceberg profile discriminate between successful and less successful athletes? A meta-analysis. *Journal of Sport & Exercice Psychology, 17*, 185-199.

Sadalla, E.K., Linder, D.E., & Jenkins, B.A. (1988). Sport preference: A self-presentational analysis. *Journal of Sport & Exercise Psychology, 10*, 214-222.

Schurr, K.T., Ashley, M.A., & Joy, K.L. (1977). A multivariate analysis of male athlete characteristics: Sport type and success. *Multivariate Experimental Clinical Research, 3*, 53-68.

Schurr K.T., Ruble, Nisbet & Wallace (1984) Myers - Briggs type inventory characteristics of more and less successful players on an American football team. *Journal of Sport Behaviour, 7*, 47-57.

Singer, R. N., Hausenblas, H. A., & Janelle, C. M. (Eds.). (2001). *Handbook of sport psychology (2nd ed.)*. New York: Wiley.

Silva, J.M. (1984). Personality and sport performance: Controversy and challenge. In J.M. & R.S. Weinberg (Eds.), *Psychological foundations of sport* (pp.59-69). Champaign, IL: Human Kinetics.

Tenebaum. G., & Bar-Eli, M. (1995). Personality and intellectual capabilities in sport psychology. In D.H. Saklofske & M Zeidner, M (Eds.), *International handbook of personality and intelligence* (pp. 687-710). New York: Plenum Press.

Vealey, R.S. (1989). Sport personology: A paradigmatic and methodological analysis. *Journal of Sport & Exercice Psychology, 11*, 216-235.

Vealey, R.S. (1992). Personality and sport: A comprehensive overview. In T. S . Horn (Ed.), *Advances in sport psychology* pp.25-59). Kingswood: Human Kinetics.

Zuckerman, M., Miyake, K., Osborne, J.J., & Koestner, R. (1991). Some new moderator variables. *Differential Assessment of Persons: A Methodological and Substantive Reappraisal. APA Division 5 Invited Symposium. The Score, 8*(4), 5-6.