Running Head: MENTALLY TOUGH BEHAVIOURS

Motivational Correlates of Mentally Tough Behaviours in Tennis

Daniel F. Gucciardi[1,2]*, Ben Jackson[3], Sheldon Hanton[4], and Machar Reid[5]

[1]*School of Physiotherapy and Exercise Science, Curtin University*

[2]*School of Human Movement Studies, The University of Queensland*

[3]*School of Sport Science, Exercise, and Health, The University of Western Australia*

[4]*Cardiff School of Sport, Cardiff Metropolitan University*

[5]*Tennis Australia*

Author Notes

*Address correspondence to Daniel Gucciardi, School of Physiotherapy and Exercise Science, Curtin University, GPO Box U1987, Perth, Australia, 6845. Phone: +61 9266 3699, Fax: +61 9266 3653, Email: daniel.f.gucciardi@gmail.com

1   **Abstract**

2   **Objectives**: The purpose of this study was to examine motivational correlates of mentally

3   tough behaviours among adolescent tennis players.

4   **Design**: Two-phase study, involving the development of an informant-rated measure of

5   mentally tough behaviours, followed by a cross-sectional survey including athlete and parent

6   assessments of study variables.

7   **Method**: In Phase One, 17 adult, high-performance tennis coaches and 20 athletes

8   participated in focus group interviews. Four scholars with expertise in performance

9   psychology also completed a short, online survey. In Phase Two, a total of 347 adolescent

10   tennis players (n_{males} = 184; $n_{females}$ = 163) aged 12 to 18 years (M = 13.93, SD = 1.47) and

11   one respective parent took part in this study. An online multisection survey containing

12   dimensions of passion, inspiration, fear of failure, and mentally tough behaviours was

13   completed. Athletes self-reported all motivational variables, whereas parents rated their child

14   solely on mentally tough behaviours.

15   **Results**: Structural equation modelling revealed that harmonious passion (β = .26, p <.01)

16   and frequency of inspiration (β = .32, p <.001) were associated with significantly higher

17   levels of mentally tough behaviours. In contrast, fear of failure (β = -.32, p <.001) and

18   obsessive passion (β = -.15, p <.01) were inversely related to mentally tough behaviours.

19   Inspiration intensity was not significantly associated with mentally tough behaviour (β = .13,

20   p = .21).

21   **Conclusions**: Motivational variables that are dispositional in nature, contextualised and

22   contingent upon features of the environment, and concern one's identity are important

23   considerations for understanding mentally tough behaviours.

24

25   *Keywords*: characteristic adaptations; identity; personality levels; traits

26   **Introduction**

27   Mental toughness is a concept that has garnered substantial interest from the general

28   public and scholars interested in achievement across a range of settings in the past decade[1].

29   For example, a search of the Web of Knowledge database from 1900 to 2013 revealed 140

30   papers, chapters, or conference presentations in which the term "mental toughness" appears

31   in the title or topic; over 95% of which have surfaced since 2000. Common themes across

32   most contemporary conceptualisations suggest that mental toughness encapsulates one's

33   personal capacity to produce consistently high levels of subjective (e.g. personal goals or

34   strivings) or objective performance (e.g. race time) despite everyday stressors and significant

35   adversities. Because most scholars consider mental toughness to represent a quality that

36   resides within an individual[2,3,4], it is of no surprise that the majority of research to date has

37   focused on understanding those personal attributes (e.g. cognitions, emotions) considered

38   central to this concept. Surprisingly, little research has been directed at understanding

39   mentally tough behaviours and their correlates.

40   Much of the existing evidence suggests that mental toughness is a multidimensional,

41   individual difference variable which is central for performance despite stress or adversity[3,4,5].

42   Although some debate exists as to the exact composition of mental toughness, several

43   qualities are common to most conceptualizations including self-efficacy, optimism, passion

44   and perseverance for long-term goals, self-regulation, and hope. Nevertheless, a key

45   methodological limitation of past work is that mentally tough behaviour has been inferred

46   rather than directly measured[6]. For example, mental toughness scholars initially suggested

47   that high achievement was the central guiding criteria for participant recruitment and

48   therefore selected participants who have represented their country at a major international

49   event such as the Olympics[5], won at least one gold medal at an major international event, or

50   worked with elite athletes in a supporting role such as a coach or sport psychologist[7].

51   Although mental toughness should be an important contributing factor as to whether one

52   reaches the international stage or attains world champion status, many other variables would

53   also likely play an important role (e.g. physical capabilities, coaching quality)[8].

54   A complementary, yet alternative approach to studying mental toughness is to directly

55   assess mentally tough behaviour. By directly assessing whether or not mentally tough

56   behaviour has occurred, we can enhance our confidence in the conclusions drawn about the

57   importance of various predictors or key correlates[6], and reduce concerns associated with

58   social desirability and the differing conceptualisations of mental toughness. Aligned with

59   recent research[6], in this study we directly assessed the extent to which individuals are

60   perceived by others, over time, as displaying mentally tough behaviours. The temporal

61   component of this operationalisation is consistent with our guiding conceptualisation, such

62   that one's reputation of being mentally tough is formed through the *consistent* demonstration

63   of salient behaviours across various situations or time points. Our first aim in this study,

64   therefore, was to develop an informant-rated measure of mentally tough behaviours. The

65   second aim was to examine both adaptive and maladaptive motivational orientations as

66   correlates of mentally tough behaviour that cut across different levels of understanding one's

67   personality[9,10] (for an overview, see Table 1). Fear of failure, inspiration, and passion were

68   identified as important considerations in this study because each concept has been reported in

69   previous mental toughness research, and is supported by an extensive body of theoretical and

70   empirical evidence as discussed below.

71   Fear of failure is conceptualised as a dispositional tendency to avoid achievement-

72   related situations or tasks in which aversive consequences (e.g. feeling ashamed or

73   embarrassed) are associated with failure[13]. It is particularly important for youths because

74   achievement motives such as fear of failure are said to be socialised during childhood and

75   adolescence[14]. Thus, fear or failure is consistent with a dispositional level of understanding

76   one's personality[9]. Adolescent sport performers have identified a number of negative

77   outcomes associated with fear of failure including a diminished perception of self, low sense

78   of achievement, emotional costs, letting significant others down, negative social evaluation,

79   and loss of motivation and drop out[15]. Further, handling failure has been cited as a core

80   feature of mental toughness[3,16]. Because this dispositional motive to avoid failure involves

81   cognitive, emotional, and behavioural experiences that are typically associated with

82   avoidance goals and strategies[17], we expected fear of failure to be inversely related with

83   mentally tough behaviours.

84   Inspiration involves an orientation towards something that is better or an awareness of

85   better possibilities (i.e. transcendence); energy and direction of behaviour towards a new idea

86   or vision (i.e. motivation); and is evoked by experiences that arise without an apparent cause

87   or are ascribed responsibility to something beyond the self (i.e. evocation)[18]. Unlike agentic

88   experiences in which individuals perceive themselves as being the origin of their behaviour,

89   inspiration captures those events that cannot be controlled but are considered highly self-

90   determined because people endorse the experience and gain volitional control from them[19].

91   Thus, one can be 'inspired by' the intrinsic value of the evocative object (e.g. observing a

92   teammate perform a difficult skill with apparent ease and precision) and 'inspired to'

93   actualise, express or imitate the qualities exemplified in an evocative object[19]. Conceptualised

94   in this way, it is unsurprising that inspiration has been reported as a key source in the

95   development and maintenance of mental toughness[16], as well as an indicator of mentally

96   tough behaviour[2]. Indeed, inspiration is positively associated with intrinsic motivation,

97   openness to experience, work mastery, creativity, perceived competence, self-esteem,

98   optimism, and positive affect[18]. As inspiration is contextualised and contingent upon features

99   of the situation or context, it can be considered at the characteristic adaptations level of

100   understanding one's personality[9] as a motivational state posited to energise the actualisation

101   of non-agentic experiences and which give rise to volitional control. Thus, inspiration should

102   evidence a positive association with mentally tough behaviours.

103   Passion, within the context of the dualistic model proposed by Vallerand and

104   colleagues[20], is defined as a "strong inclination toward an activity that people like, that they

105   find important, and in which they invest time and energy" (p. 757). A passionate tennis

106   player, for example, does not simply play tennis because s/he gains pleasure and enjoyment

107   from the activity, s/he *is* a tennis player. Two distinct types of passion have been proposed to

108   arise from this internalisation process[20]. Harmonious passion refers to an internalisation

109   process that does not involve internal (e.g. self-esteem) or external pressures (e.g. social

110   acceptance), but rather occurs from one's free choice to engage in an activity for the pleasure

111   and satisfaction derived from the inherent features of the activity (e.g. positive emotions,

112   sense of accomplishment). Thus, harmonious passion results from an autonomous

113   internalisation of the activity into one's identity because it is not contingent upon factors

114   other than one's own personal endorsement about its value and meaningfulness for him or

115   her[20]. In contrast, obsessive passion results from a controlled internalisation of the activity

116   into one's identity because of external or internal pressures and can therefore consume one's

117   thoughts and overwhelm one's identity[20]. Unlike harmonious passion, which aligns well with

118   other aspects of the person's life (e.g. work, education, relationships), the importance of the

119   passionate activity becomes disproportionate to other life domains for people with high levels

120   of obsessive passion, which often occurs to the detriment to these activities. Thus, passion is

121   consistent with the identity level of understanding personality that incorporates one's past,

122   present and future selves[9]. An extensive body of research has supported the superiority of

123   harmonious passion for adaptive outcomes when compared with obsessive passion, and in

124   some cases obsessive passion leads to negative consequences[21]. Not surprisingly, passion has

125   been cited as a core component of mental toughness[2]. Thus, we hypothesised that harmonious

126 passion would be more positively associated with mentally tough behaviour when compared

127 with obsessive passion.

Method

129   There were two iterative phases to this research. Ethical approval was obtained for

130 both phases from the relevant university ethics committee before participant recruitment. In

131 Phase One, four scholars with expertise in performance psychology, mental toughness, and

132 scale development, as well as 37 key stakeholders were sampled to develop a list of mentally

133 tough behaviours. Key tennis stakeholders included 17 adult, high-performance coaches (1

134 female) who coached players who were part of national or state representative squads and 20

135 tennis players. Coaches were an opportunistic sample of individuals who had played tennis at

136 an elite level and had several years of experience coaching adolescent tennis players in the

137 elite development pathway. The players were 9 males and 11 females aged between 10 and

138 19 years old ($M = 14.80$, $SD = 2.31$). First, four focus group interviews were conducted with

139 coaches and players who attended a Tennis Australia draft camp at the Australian Institute of

140 Sport; two player ($n = 3$, $n = 4$) and two coach groups ($n = 10$, $n = 7$). Another two focus

141 groups were held with state-level players ($n = 7$, $n = 6$). In each session, the coaches and

142 players worked collaboratively with the lead researcher to develop a list of mentally tough

143 behaviours. After capturing the views of players and coaches, academic experts were invited

144 by email to provide feedback on the quality of the mental toughness behaviours using an

145 online survey. Experts provided ratings on a 5-point scale ($1 = poor$, $3 = good$, $5 = excellent$)

146 and open-ended comments (e.g. relevance and precision of item wordings) of the mentally

147 tough behaviours captured.

148   In Phase Two, a total of 347 adolescent tennis players ($n_{males} = 184$; $n_{females} = 163$)

149 aged 12 to 18 years ($M = 13.93$, $SD = 1.47$) were recruited via tournaments of Tennis

150 Australia's Optus Junior Tour. Tournament directors sent an email invitation on behalf of the

151 researchers to the parents of registered players which included an overview of the study, a

152 copy of the survey package, and statements regarding ethical guidelines (e.g. informed

153 consent, confidentiality, anonymity, data management). Parents and players who expressed

154 an interest in participating were directed to an encrypted website which contained the survey

155 package. Players then completed a 25-item, multisection survey containing reliable and valid

156 measures of fear of failure[10] (5 items), inspiration[18] (8 items), and passion[20] (12 items),

157 whereas parents provided an assessment of mentally tough behaviours with their child as the

158 point of reference. The informant-rated approach was designed to alleviate concerns

159 associated with common method bias[22] and is consistent with recent efforts to measure

160 mentally tough behaviours[6]. Mentally tough behaviours (1 = *false 100% of the time* to 7 =

161 *true 100% of the time*), passion (1 = *do not agree at all* to 7 = *very strongly agree*), and

162 inspiration (1 = *never or not at all* to 7 = *very often or very deeply/strongly*) were rated on a

163 7-point Likert scale, whereas fear of failure was assessed on a 5-point scale (1 = *do not*

164 *believe at all* to 5 = *believe 100% of the time*).

165 Structural equation modelling (SEM) analyses were performed in Mplus 7[23] using full

166 information maximum-likelihood procedure (FIML) estimation and a robust maximum

167 likelihood estimator (MLR). In contrast to other methods of handling missing data (e.g.

168 deletion, imputation[24]), the FIML estimator computes parameter estimates using all available

169 information. The MLR estimator produces standard errors and tests of fit that are robust in

170 relation to non-normality of observations[25,26]. The χ^2 goodness-of-fit statistic, comparative fit

171 index (CFI $\geq$.90), Tucker-Lewis index (TLI $\geq$.90), standardized root mean square residual

172 (SRMR $\leq$.08), and root mean square error of approximation (RMSEA $\leq$.08) were used as a

173 collective to evaluate model fit[27]. A composite reliability coefficient[28] was calculated to

174 estimate the level of internal reliability for each latent factor.

175 **Results**

176   A total of 12 mentally tough behaviours were generated from the coach and athlete

177 focus group discussions. The academic experts believed that these descriptions were very

178 good representations of mentally tough behaviours ($M = 4.67$). However, the experts noted

179 that two items ("When under pressure, s/he makes good decisions" and "When faced with an

180 unexpected event, s/he is good at changing her/his strategy") were highly similar to items 10

181 and 9, respectively (see Table 2), and were therefore removed from the item pool. The final

182 10 mentally tough behaviours and their descriptive statistics are listed in Table 2.

183   SEM was employed in Phase Two to examine the relationships between mentally

184 tough behaviours and the hypothesised motivational correlates. SEM is used routinely to test

185 relationships between observed (measured) and unobserved (latent) variables as well as

186 associations between two or more latent variables. Unlike multiple regression, which assumes

187 that observed variables are measured without error, SEM explicitly models measurement

188 error thereby producing minimally biased parameter estimates[29]. Age was included as a

189 covariate because the of the large age range of our participants. The fit statistics indicated

190 acceptable model-data fit, $\chi^2(570) = 1108.61$, $p < .001$, CFI $= .915$, TLI $= .906$, SRMR $=$

191 .053, RMSEA $= .052$ (90% CI $= .048$ to .057). Adequate internal reliability estimates were

192 obtained for mental toughness ($\rho = .91$), fear of failure ($\rho = .82$), inspiration intensity ($\rho =$

193 .90), and inspiration frequency ($\rho = .91$), obsessive passion ($\rho = .86$), and harmonious passion

194 ($\rho = .82$). Age was significantly associated with obsessive ($\beta = -.13$, $p < .05$) and harmonious

195 passion ($\beta = -.14$, $p < .05$), inspiration frequency ($\beta = -.16$, $p < .01$) and intensity ($\beta = -.11$, p

196 $< .05$), and fear of failure ($\beta = .26$, $p < .001$), but not mentally tough behaviours ($\beta = -.03$, $p =$

197 .71). A visual display of the results of the structural parameters is presented in Figure 1.

198 Higher levels of harmonious passion ($\beta = .26$, $p < .01$) and frequency of inspiration ($\beta = .32$, p

199 $< .001$) were associated with significantly higher levels of mentally tough behaviours. In

200 contrast, fear of failure ($\beta = -.32$, $p < .001$) and obsessive passion ($\beta = -.15$, $p < .01$) were

201   inversely related to mentally tough behaviours. Inspiration intensity was not significantly

202   associated with mentally tough behaviour ($\beta = .13$, $p = .21$). Collectively, these motivational

203   variables predicted 51% of the variance in mentally tough behaviour.

Discussion

205   The aims of this study were to develop an informant-rated measure of mentally

206   behaviours, and examine their motivational correlates among adolescent tennis players.

207   Consistent with our guiding conceptualisation and recent research[6], we demonstrated the

208   value of an alternative approach to studying mental toughness in which mentally tough

209   behaviours are directly assessed rather than assumed based on achievement levels. Alongside

210   evidence for content validity from players, coaches, and academic experts, our informant-

211   rated measure of mentally tough behaviours evidenced sound factorial validity and internal

212   reliability. When compared with objective measures of achievement, an informant-rated

213   approach is less likely to be confounded by other important variables such as skill, talent, and

214   practice[6]. Nevertheless, an important avenue for future research on informant-ratings of

215   mentally tough behaviours is to examine a triangulation approach across different assessors

216   (e.g. parent, coach, peer) for the same target individual.

217   Fear of failure provided a dispositional sketch which speaks to a person's

218   motivational style or consistency in behaviour across situations and time[9]. Typically, fear of

219   failure leads to the adoption of avoidance-based goals and strategies such as self-

220   handicapping that in turn exert a debilitative effect on variables such as effort expenditure,

221   persistence, and performance attainment[30,31]. Consistent with these expectations, fear of

222   failure was inversely related with mentally tough behaviours thereby indicating that those

223   players with a lower tendency to experience shame following failure are more likely to

224   effectively manage challenges and demands as a tennis player over time.

225   Inspiration captures features of the context that energise and give rise to volitional

226   control[18,19]. We found that players who experienced inspiration on a regular basis are more

227   likely to behave in a mentally tough manner, yet the same cannot be said for the strength at

228   which inspiration is experienced. This finding contrasts with previous research in which the

229   relationships between the intensity and frequency dimensions of inspiration with important

230   outcomes (e.g. intrinsic motivation, positive affect) are typically similar in strength[18]. The

231   overlap ($r = .86$) between these two inspiration dimensions offers an explanation for this

232   inconsistency; conceptually, adolescent athletes may not have easily distinguished between

233   the two inspiration components. Additionally, whereas previous research has employed

234   regression analyses that assume measurement is error free[18], we explicitly modelled error via

235   SEM thereby minimising the chance of biased parameter estimates[29].

236   Passion provided an insight into a self-defining characteristic of athletes' sense of

237   who they are[9]. Those players who have internalised their strong inclination towards tennis in

238   an autonomous manner such that it is important to their identity but not overpowering (i.e.

239   harmonious passion) are more likely to be in control of their engagement of the activity, even

240   though it occupies a central role in their life[20]. An increased sense of control over their

241   engagement in tennis would create fewer conflicts with other important aspects in their life

242   (e.g. school, relationships with family) and arguably place them in a better position to deal

243   with the challenges they face as a tennis player. Consistent with these expectations,

244   harmonious passion was associated with higher levels of mentally tough behaviours, whereas

245   obsessive passion evidenced an inverse relationship.

Conclusion

247   Strengths of this study include the informant-rated measure of mentally tough

248   behaviours (i.e. minimises concerns associated with common method bias), consideration of

249   motivational orientations at different levels of one's personality[9], and the modelling of

250   measurement error within our analyses. Nevertheless, our study is not without limitation and

251   these areas should be considered in future research. First, the cross-sectional nature of our

252   design does not permit inferences regarding causality; experimental designs would prove

253   fruitful in this regard. Second, we examined a small subset of motivational correlates;

254   substantive insights will be gained by including cognitive (e.g. personal and relational

255   efficacy perceptions), affective (e.g. intensity and directional interpretations of anxiety) and

256   belief-based correlates (e.g. perceptions of whether mental toughness is considered

257   immutable or malleable). Third, parents' ratings of their child's behaviours may have been

258   influenced by social desirability or their own personality; for example, parents with high ego

259   orientations who live vicariously through their child may report biased assessments. An

260   examination of inter-rater consistency from multiple informant assessments (e.g. coach, peer,

261   parent) would be informative. Finally, our focus on elite, emerging youth in an Australian

262   context limits the extent to which these findings generalise to other populations. In summary,

263   our findings revealed motivational orientations that are dispositional in nature, contextualised

264   and contingent upon features of the situation or context, and concern one's identity are

265   important considerations for understanding mentally tough behaviours among adolescent

266   tennis players.

267   **Practical Implications**

268   ▪ when young athletes fail, reinforce aspects of their performance that were executed

269   proficiently

270   ▪ provide athletes with opportunities to experience inspiration on a more frequent basis

271   ▪ reinforce aspects of tennis that players value, enjoy and find meaningful

References

1.   Gucciardi DF, Gordon S. (Eds.), *Mental toughness in sport: Developments in research and theory*, London, Routledge, 2011.

2.   Coulter TJ, Mallett, CJ, Gucciardi, DF. Understanding mental toughness in Australian soccer: Perceptions of players, parents, and coaches. *J Sport Sci* 2010, 28: 699-716. doi: 10.1080/02640411003734085

3.   Driska AP, Kamphoff C, Armentrout SM. Elite swimming coaches' perceptions of mental toughness. *Sport Psychol,* 2012, 26: 186-206.

4.   Weinberg R, Butt J, Culp B. Coaches' views of mental toughness and how it is built. *Int J Sport Exercise Psy,* 2012, 9: 156-172. doi: 10.1080/1612197x.2011.567106

5.   Jones G, Hanton S, Connaughton D. What is this thing called mental toughness? An investigation of elite sport performers. *J Appl Sport Psychol,* 2002, 14: 205-218. doi: 10.1080/10413200290103509

6.   Hardy L, Bell J, Beattie S. A neuropsychological model of mentally tough behaviour. *J Pers,* in press: doi: 10.1111/jopy.12034

7.   Jones G, Hanton S, Connaughton D. A framework of mental toughness in the world's best performers. *Sport Psychol,* 2007, 21: 243-264.

8.   Gulbin JP, Croser MJ, Morley EJ et al. An integrated framework for the optimisation of sport and athlete development: a practitioner approach. *J Sport Sci* 2013, 31: 1319-1331. doi: 10.1080/02640414.2013.781661

9.   McAdams DP, Pals JL. A new Big Five: fundamental principles for an integrative science of personality. *Am Psychol,* 2006, 61: 204–217. doi: 10.1037/0003-066X.61.3.204

10.   XXXX. Knowing athletes and exercisers: understanding the whole person through the lens of contemporary personality psychology. *Manuscript submitted for publication*.

11.   Goldberg LR. Language and individuals differences: the search for universals in personality lexicons, Chapter 5, in *Review of Personality and Social Psychology,* 2nd ed., California, Sage, 1981.

12.   Cattell RB, Eber HW, Tatsuoka MM. *Handbook of the Sixteen Personality Factor Questionnaire (16PF).* Illinois, IPAT, 1970.

13.   Conroy DE, Willow JP, Metzler JN. Multidimensional fear of failure measurement: The performance failure appraisal inventory. *J Appl Sport Psychol,* 2002, 14: 76–90. doi: 10.1080/10413200252907752

14.   McClelland DC. The importance of early learning in the formation of motives, Chapter 32, in *Motives in fantasy, action, and society,* New Jersey, Van Nostrand, 1958.

15.   Sagar SS, Lavallee D, Spray CM. Why young elite athletes fear failure: Consequences of failure. *J Sport Sci*, 2007, 25: 1171–1184. doi: 10.1080/02640410601040093

16.   Connaughton D, Hanton S, Jones G. The development and maintenance of mental toughness in the world's best performers. *Sport Psychol,* 2010, 24: 168-193.

17.   Conroy DE, Elliot AJ. Fear of failure and achievement goals in sport: Addressing the issue of the chicken and the egg. *Anxiety Stress Copin*, 2004, 17: 271–286. doi: 10.1080/1061580042000191642

18.   Thrash TM, Elliot AJ. Inspiration as a psychological construct. *J Pers Soc Psychol,* 2003, 84: 871-889. doi: 10.1037/0022-3514.84.4.871

19.   Thrash TM, Elliot AJ. Inspiration: Core characteristics, components processes, antecedents, and function. *J Pers Soc Psychol,* 2004, 87: 957-973. doi: 10.1037/0022-3514.87.6.957

20.   Vallerand RJ, Blanchard CM, Mageau GA et al. Les passions de l'âme: On obsessive and harmonious passion. *J Pers Soc Psychol,* 2003, 85: 756-767. doi: 10.1037/0022-3514-85.4.756

21.   Vallerand RJ. Passion for sport and exercise: The dualistic model of passion, Chapter 5, in *Advances in motivation in sport and exercise,* 3rd ed., Illinois, Human Kinetics, 2012.

22.   Podsakoff PM, MacKenzie SB, Lee J-Y et al. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J App Psychol*, 2003, 88: 879–903. doi: 10.1037/0021-9101.88.5.879

23.   Muthén LK, Muthén BO. *Mplus user's guide* (7th ed.). Los Angeles, Muthén & Muthén, 1998-2012.

24.   Graham JW. Missing data analysis: Making it work in the real world. *Annu Rev Psychol,* 2009, 60: 549-576. doi: 10.1146/annurev.psych.58.110405.085530

25.   Beauducel A, Herzberg PY. On the performance of maximum likelihood versus means and variance adjusted weighted least squares estimation in CFA. *Struct Equ Modeling,* 2006, 13: 186-203. doi: 10.1207/s15328007sem1302_2.

26.   Muthén BO, Kaplan D. A comparison of some methodologies for the factor analysis of nonnormal Likert variables. *Brit J Math Stat Psy,* 1985, 38: 171-189. doi*:* 10.1111/j.2044-8317.1992.tb00975.x

27.   Browne MW, Cudeck R. Alternative ways of assessing model fit. *Sociol Method Res,* 1992, 21: 230-258. doi:10.1177/0049124192021002005

28.   Raykov T. Estimation of composite reliability for congeneric measures. *Appl Psych Meas*, 1997, 21: 173-184. doi: 10.1177/01466216970212006.

29.   Byrne BM. *Structural equation modelling with Mplus: Basic concepts, applications, and programming.* New York, Routledge, 2011.

30.   Chen LH, Wu C-H, Kee YH et al. Fear of failure, 2 x 2 achievement goal and self-handicapping: An examination of the hierarchical model of achievement motivation in physical education. *Contemp Educ Psychol,* 2009, 34: 298-305. doi:10.1016/j.cedpsych.2009.06.006

31.   Elliot AJ, Church MA. A hierarchical model of approach and avoidance achievement

motivation. *J Pers Soc Psychol*, 1997, 72: 218-232. doi: 10.1037//0022-3514.72.1.218

Table 1. Overview of McAdams and Pals' (2006)[8] integrative framework of personality psychology.

Central Tenet: Personality encompasses key individual difference variables situated at different layers of understanding and which serve different purposes in explaining people's behaviour.		
Layer of Understanding	*Definition*	*Elaboration and Examples*
Dispositional Traits	"Variations on a small set of broad dispositional traits implicated in social life (both in the [environment of evolutionary adaptedness] and today) constitute the most stable and recognizable aspect of psychological individuality" (p. 207).	Dispositional traits refer to those broad cognitive, emotional, and behavioural dimensions that evidence consistency across situations and over time; that is, they provide an indication of usual ways of thinking, feeling, and behaviour. Typically, these traits house the likes of the "Big Five"[11] or "16pf"[12], each of which provide a dispositional outline of psychological individuality.
Characteristic Adaptations	"Beyond dispositional traits, human lives vary with respect to a wide range of motivational, social– cognitive, and developmental adaptations, contextualized in time, place, and/or social role" (p. 208).	Characteristic adaptations represent contextualised expressions of dispositional traits that are activated or shaped by contextual or social factors (e.g. motives, values, coping styles, personal strivings, self-beliefs). By their very nature, characteristic adaptations are considered more malleable and open to change than are dispositional traits given the perceived influence of social and cultural forces.
Life Stories or Personal Narratives	"Beyond dispositional traits and characteristic adaptations, human lives vary with respect to the integrative life stories, or personal narratives, that individuals construct to make meaning and identity in the modern world" (p. 209).	The internalised and evolving psychosocial construction of one's identity is thought to instil a sense of meaning, unity, and purpose in relation to each person's remembered and reconstructed past, present, and future selves. Life stories integrate personal events, experiences, and other self-defining memories across time and context to bring coherence and meaning to each individual's life.

Table 2. Item content and descriptive statistics for the informant measure of mentally tough behaviours.

		M	SD	Skew	Kurtosis
1.	My daughter/son consistently bounces back from setbacks	5.17	1.27	-.59	.26
2.	My daughter/son works hard no matter what setbacks s/he encounters	5.81	1.18	-1.33	2.33
3.	No matter how my daughter/son is feeling, s/he is able to perform to the best of her/his ability	5.61	1.38	-1.09	.98
4.	My daughter/son keeps performing well when challenged	5.56	1.18	-.67	.29
5.	My daughter/son does what s/he needs to do to perform well	5.84	1.07	-1.18	2.09
6.	My daughter/son refuses to give up when things get tough	5.89	1.25	-1.50	2.69
7.	My daughter/son responds well to challenges	5.57	1.15	-.85	.89
8.	My daughter/son is good at fighting for every point	5.71	1.33	-1.11	1.07
9.	When things don't go to plan, my daughter/son is good at changing the way s/he plays	5.08	1.25	-.53	.16
10.	In general, my daughter/son is a good decision maker	5.33	1.30	-1.11	1.23

Figure 1. *Standardised parameter estimates of the structural equation model: Passion, fear of failure, and inspiration predict mentally tough behaviours* (Note: item indicators and latent correlations with age are excluded for parsimony; dotted lines represent non-significant estimates; * p <.05; ** p <.01; *** p <.001).