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Motivational Correlates of Mentally Tough Behaviours in Tennis

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Introduction

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Mental toughness is a concept that has garnered substantial interest from the general public and scholars interested in achievement across a range of settings in the past decade¹. For example, a search of the Web of Knowledge database from 1900 to 2013 revealed 140 papers, chapters, or conference presentations in which the term “mental toughness” appears in the title or topic; over 95% of which have surfaced since 2000. Common themes across most contemporary conceptualisations suggest that mental toughness encapsulates one’s personal capacity to produce consistently high levels of subjective (e.g. personal goals or strivings) or objective performance (e.g. race time) despite everyday stressors and significant adversities. Because most scholars consider mental toughness to represent a quality that resides within an individual^{2,3,4}, it is of no surprise that the majority of research to date has focused on understanding those personal attributes (e.g. cognitions, emotions) considered central to this concept. Surprisingly, little research has been directed at understanding mentally tough behaviours and their correlates.

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Much of the existing evidence suggests that mental toughness is a multidimensional, individual difference variable which is central for performance despite stress or adversity^{3,4,5}. Although some debate exists as to the exact composition of mental toughness, several qualities are common to most conceptualizations including self-efficacy, optimism, passion and perseverance for long-term goals, self-regulation, and hope. Nevertheless, a key methodological limitation of past work is that mentally tough behaviour has been inferred rather than directly measured⁶. For example, mental toughness scholars initially suggested that high achievement was the central guiding criteria for participant recruitment and therefore selected participants who have represented their country at a major international event such as the Olympics⁵, won at least one gold medal at an major international event, or worked with elite athletes in a supporting role such as a coach or sport psychologist⁷.

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 correlates⁶, and reduce concerns associated with
58 social desirability and the differing conceptualisations of mental toughness. Aligned with
59 recent research⁶, 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 failure¹³. It is particularly important for youths because
74 achievement motives such as fear of failure are said to be socialised during childhood and
75 adolescence¹⁴. Thus, fear of failure is consistent with a dispositional level of understanding

76 one's personality⁹. 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 out¹⁵. 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 strategies¹⁷, 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 them¹⁹.
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 object¹⁹. 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 toughness¹⁶, as well as an indicator of mentally
96 tough behaviour². Indeed, inspiration is positively associated with intrinsic motivation,
97 openness to experience, work mastery, creativity, perceived competence, self-esteem,
98 optimism, and positive affect¹⁸. 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 personality⁹ 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 colleagues²⁰, 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 process²⁰. 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 her²⁰. 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 identity²⁰. 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 selves⁹. 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 consequences²¹. Not surprisingly, passion has
125 been cited as a core component of mental toughness². Thus, we hypothesised that harmonious

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

128 **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 ($n_{\text{males}} = 184$; $n_{\text{females}} = 163$)
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 failure¹⁰ (5 items), inspiration¹⁸ (8 items), and passion²⁰ (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 bias²² and is consistent with recent efforts to measure
160 mentally tough behaviours⁶. 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 7²³ 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, imputation²⁴), 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 fit²⁷. A composite reliability coefficient²⁸ was calculated to
174 estimate the level of internal reliability for each latent factor.

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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 estimates²⁹. Age was included as a
189 covariate because 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.

204 **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 research⁶, 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 practice⁶. 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 time⁹. 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 debilitating 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 strength¹⁸. 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 free¹⁸, we explicitly modelled error via
235 SEM thereby minimising the chance of biased parameter estimates²⁹.

236 Passion provided an insight into a self-defining characteristic of athletes' sense of
237 who they are⁹. 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 life²⁰. 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.

246 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 personality⁹, 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

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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, Lavalley 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.		
<i>Layer of Understanding</i>	<i>Definition</i>	<i>Elaboration and Examples</i>
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; * $p < .05$; ** $p < .01$; *** $p < .001$).

