Motivational Correlates of Mentally Tough Behaviours in Tennis

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Abstract

Objectives: The purpose of this study was to examine motivational correlates of mentally tough behaviours among adolescent tennis players.

Design: Two-phase study, involving the development of an informant-rated measure of mentally tough behaviours, followed by a cross-sectional survey including athlete and parent assessments of study variables.

Method: In Phase One, 17 adult, high-performance tennis coaches and 20 athletes participated in focus group interviews. Four scholars with expertise in performance psychology also completed a short, online survey. In Phase Two, a total of 347 adolescent tennis players (n_males = 184; n_females = 163) aged 12 to 18 years (M = 13.93, SD = 1.47) and one respective parent took part in this study. An online multisection survey containing dimensions of passion, inspiration, fear of failure, and mentally tough behaviours was completed. Athletes self-reported all motivational variables, whereas parents rated their child solely on mentally tough behaviours.

Results: Structural equation modelling revealed that harmonious passion (β = .26, p < .01) and frequency of inspiration (β = .32, p < .001) were associated with significantly higher levels of mentally tough behaviours. In contrast, fear of failure (β = -.32, p < .001) and obsessive passion (β = -.15, p < .01) were inversely related to mentally tough behaviours. Inspiration intensity was not significantly associated with mentally tough behaviour (β = .13, p = .21).

Conclusions: Motivational variables that are dispositional in nature, contextualised and contingent upon features of the environment, and concern one’s identity are important considerations for understanding mentally tough behaviours.

Keywords: characteristic adaptations; identity; personality levels; traits
Mentally Tough Behaviours

Introduction

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 decade. 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, 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.

Much of the existing evidence suggests that mental toughness is a multidimensional, individual difference variable which is central for performance despite stress or adversity. 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 measured. 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 Olympics, 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 psychologist.
Although mental toughness should be an important contributing factor as to whether one reaches the international stage or attains world champion status, many other variables would also likely play an important role (e.g. physical capabilities, coaching quality).

A complementary, yet alternative approach to studying mental toughness is to directly assess mentally tough behaviour. By directly assessing whether or not mentally tough behaviour has occurred, we can enhance our confidence in the conclusions drawn about the importance of various predictors or key correlates, and reduce concerns associated with social desirability and the differing conceptualisations of mental toughness. Aligned with recent research, in this study we directly assessed the extent to which individuals are perceived by others, over time, as displaying mentally tough behaviours. The temporal component of this operationalisation is consistent with our guiding conceptualisation, such that one’s reputation of being mentally tough is formed through the consistent demonstration of salient behaviours across various situations or time points. Our first aim in this study, therefore, was to develop an informant-rated measure of mentally tough behaviours. The second aim was to examine both adaptive and maladaptive motivational orientations as correlates of mentally tough behaviour that cut across different levels of understanding one’s personality (for an overview, see Table 1). Fear of failure, inspiration, and passion were identified as important considerations in this study because each concept has been reported in previous mental toughness research, and is supported by an extensive body of theoretical and empirical evidence as discussed below.

Fear of failure is conceptualised as a dispositional tendency to avoid achievement-related situations or tasks in which aversive consequences (e.g. feeling ashamed or embarrassed) are associated with failure. It is particularly important for youths because achievement motives such as fear of failure are said to be socialised during childhood and adolescence. Thus, fear or failure is consistent with a dispositional level of understanding...
one’s personality. Adolescent sport performers have identified a number of negative outcomes associated with fear of failure including a diminished perception of self, low sense of achievement, emotional costs, letting significant others down, negative social evaluation, and loss of motivation and drop out. Further, handling failure has been cited as a core feature of mental toughness. Because this dispositional motive to avoid failure involves cognitive, emotional, and behavioural experiences that are typically associated with avoidance goals and strategies, we expected fear of failure to be inversely related with mentally tough behaviours.

Inspiration involves an orientation towards something that is better or an awareness of better possibilities (i.e. transcendence); energy and direction of behaviour towards a new idea or vision (i.e. motivation); and is evoked by experiences that arise without an apparent cause or are ascribed responsibility to something beyond the self (i.e. evocation). Unlike agentic experiences in which individuals perceive themselves as being the origin of their behaviour, inspiration captures those events that cannot be controlled but are considered highly self-determined because people endorse the experience and gain volitional control from them.

Thus, one can be ‘inspired by’ the intrinsic value of the evocative object (e.g. observing a teammate perform a difficult skill with apparent ease and precision) and ‘inspired to’ actualise, express or imitate the qualities exemplified in an evocative object. Conceptualised in this way, it is unsurprising that inspiration has been reported as a key source in the development and maintenance of mental toughness, as well as an indicator of mentally tough behaviour. Indeed, inspiration is positively associated with intrinsic motivation, openness to experience, work mastery, creativity, perceived competence, self-esteem, optimism, and positive affect. As inspiration is contextualised and contingent upon features of the situation or context, it can be considered at the characteristic adaptations level of understanding one’s personality as a motivational state posited to energise the actualisation
of non-agentic experiences and which give rise to volitional control. Thus, inspiration should
evidence a positive association with mentally tough behaviours.

Passion, within the context of the dualistic model proposed by Vallerand and
colleagues, is defined as a “strong inclination toward an activity that people like, that they
find important, and in which they invest time and energy” (p. 757). A passionate tennis
player, for example, does not simply play tennis because s/he gains pleasure and enjoyment
from the activity, s/he is a tennis player. Two distinct types of passion have been proposed to
arise from this internalisation process. Harmonious passion refers to an internalisation
process that does not involve internal (e.g. self-esteem) or external pressures (e.g. social
acceptance), but rather occurs from one’s free choice to engage in an activity for the pleasure
and satisfaction derived from the inherent features of the activity (e.g. positive emotions,
sense of accomplishment). Thus, harmonious passion results from an autonomous
internalisation of the activity into one’s identity because it is not contingent upon factors
other than one’s own personal endorsement about its value and meaningfulness for him or
her. In contrast, obsessive passion results from a controlled internalisation of the activity
into one’s identity because of external or internal pressures and can therefore consume one’s
thoughts and overwhelm one’s identity. Unlike harmonious passion, which aligns well with
other aspects of the person’s life (e.g. work, education, relationships), the importance of the
passionate activity becomes disproportionate to other life domains for people with high levels
of obsessive passion, which often occurs to the detriment to these activities. Thus, passion is
consistent with the identity level of understanding personality that incorporates one’s past,
present and future selves. An extensive body of research has supported the superiority of
harmonious passion for adaptive outcomes when compared with obsessive passion, and in
some cases obsessive passion leads to negative consequences. Not surprisingly, passion has
been cited as a core component of mental toughness. Thus, we hypothesised that harmonious
passion would be more positively associated with mentally tough behaviour when compared with obsessive passion.

Method

There were two iterative phases to this research. Ethical approval was obtained for both phases from the relevant university ethics committee before participant recruitment. In Phase One, four scholars with expertise in performance psychology, mental toughness, and scale development, as well as 37 key stakeholders were sampled to develop a list of mentally tough behaviours. Key tennis stakeholders included 17 adult, high-performance coaches (1 female) who coached players who were part of national or state representative squads and 20 tennis players. Coaches were an opportunist sample of individuals who had played tennis at an elite level and had several years of experience coaching adolescent tennis players in the elite development pathway. The players were 9 males and 11 females aged between 10 and 19 years old ($M = 14.80, SD = 2.31$). First, four focus group interviews were conducted with coaches and players who attended a Tennis Australia draft camp at the Australian Institute of Sport; two player ($n = 3, n = 4$) and two coach groups ($n = 10, n = 7$). Another two focus groups were held with state-level players ($n = 7, n = 6$). In each session, the coaches and players worked collaboratively with the lead researcher to develop a list of mentally tough behaviours. After capturing the views of players and coaches, academic experts were invited by email to provide feedback on the quality of the mental toughness behaviours using an online survey. Experts provided ratings on a 5-point scale (1 = poor, 3 = good, 5 = excellent) and open-ended comments (e.g. relevance and precision of item wordings) of the mentally tough behaviours captured.

In Phase Two, a total of 347 adolescent tennis players ($n_{\text{males}} = 184; n_{\text{females}} = 163$) aged 12 to 18 years ($M = 13.93, SD = 1.47$) were recruited via tournaments of Tennis Australia’s Optus Junior Tour. Tournament directors sent an email invitation on behalf of the
researchers to the parents of registered players which included an overview of the study, a copy of the survey package, and statements regarding ethical guidelines (e.g. informed consent, confidentiality, anonymity, data management). Parents and players who expressed an interest in participating were directed to an encrypted website which contained the survey package. Players then completed a 25-item, multisection survey containing reliable and valid measures of fear of failure\(^\text{10}\) (5 items), inspiration\(^\text{18}\) (8 items), and passion\(^\text{20}\) (12 items), whereas parents provided an assessment of mentally tough behaviours with their child as the point of reference. The informant-rated approach was designed to alleviate concerns associated with common method bias\(^\text{22}\) and is consistent with recent efforts to measure mentally tough behaviours\(^\text{6}\). Mentally tough behaviours (1 = \textit{false} 100\% of the time to 7 = \textit{true} 100\% of the time), passion (1 = \textit{do not agree at all} to 7 = \textit{very strongly agree}), and inspiration (1 = \textit{never or not at all} to 7 = \textit{very often or very deeply/strongly}) were rated on a 7-point Likert scale, whereas fear of failure was assessed on a 5-point scale (1 = \textit{do not believe at all} to 5 = \textit{believe 100\% of the time}).

Structural equation modelling (SEM) analyses were performed in Mplus\(^\text{23}\) using full information maximum-likelihood procedure (FIML) estimation and a robust maximum likelihood estimator (MLR). In contrast to other methods of handling missing data (e.g. deletion, imputation\(^\text{24}\)), the FIML estimator computes parameter estimates using all available information. The MLR estimator produces standard errors and tests of fit that are robust in relation to non-normality of observations\(^\text{25,26}\). The \(\chi^2\) goodness-of-fit statistic, comparative fit index (CFI \(\geq .90\)), Tucker-Lewis index (TLI \(\geq .90\)), standardized root mean square residual (SRMR \(\leq .08\)), and root mean square error of approximation (RMSEA \(\leq .08\)) were used as a collective to evaluate model fit\(^\text{27}\). A composite reliability coefficient\(^\text{28}\) was calculated to estimate the level of internal reliability for each latent factor.

**Results**
Mentally Tough Behaviours

A total of 12 mentally tough behaviours were generated from the coach and athlete focus group discussions. The academic experts believed that these descriptions were very good representations of mentally tough behaviours ($M = 4.67$). However, the experts noted that two items (“When under pressure, s/he makes good decisions” and “When faced with an unexpected event, s/he is good at changing her/his strategy”) were highly similar to items 10 and 9, respectively (see Table 2), and were therefore removed from the item pool. The final 10 mentally tough behaviours and their descriptive statistics are listed in Table 2.

SEM was employed in Phase Two to examine the relationships between mentally tough behaviours and the hypothesised motivational correlates. SEM is used routinely to test relationships between observed (measured) and unobserved (latent) variables as well as associations between two or more latent variables. Unlike multiple regression, which assumes that observed variables are measured without error, SEM explicitly models measurement error thereby producing minimally biased parameter estimates$^{29}$. Age was included as a covariate because of the large age range of our participants. The fit statistics indicated an acceptable model-data fit, $\chi^2(570) = 1108.61$, $p < .001$, CFI = .915, TLI = .906, SRMR = .053, RMSEA = .052 (90% CI = .048 to .057). Adequate internal reliability estimates were obtained for mental toughness ($\rho = .91$), fear of failure ($\rho = .82$), inspiration intensity ($\rho = .90$), and inspiration frequency ($\rho = .91$), obsessive passion ($\rho = .86$), and harmonious passion ($\rho = .82$). Age was significantly associated with obsessive ($\beta = -.13$, $p < .05$) and harmonious passion ($\beta = -.14$, $p < .05$), inspiration frequency ($\beta = -.16$, $p < .01$) and intensity ($\beta = -.11$, $p < .05$), and fear of failure ($\beta = .26$, $p < .001$), but not mentally tough behaviours ($\beta = -.03$, $p = .71$). A visual display of the results of the structural parameters is presented in Figure 1.

Higher levels of harmonious passion ($\beta = .26$, $p < .01$) and frequency of inspiration ($\beta = .32$, $p < .001$) were associated with significantly higher levels of mentally tough behaviours. In contrast, fear of failure ($\beta = -.32$, $p < .001$) and obsessive passion ($\beta = -.15$, $p < .01$) were
inversely related to mentally tough behaviours. Inspiration intensity was not significantly associated with mentally tough behaviour ($\beta = .13, p = .21$). Collectively, these motivational variables predicted 51% of the variance in mentally tough behaviour.

**Discussion**

The aims of this study were to develop an informant-rated measure of mentally behaviours, and examine their motivational correlates among adolescent tennis players. Consistent with our guiding conceptualisation and recent research, we demonstrated the value of an alternative approach to studying mental toughness in which mentally tough behaviours are directly assessed rather than assumed based on achievement levels. Alongside evidence for content validity from players, coaches, and academic experts, our informant-rated measure of mentally tough behaviours evidenced sound factorial validity and internal reliability. When compared with objective measures of achievement, an informant-rated approach is less likely to be confounded by other important variables such as skill, talent, and practice. Nevertheless, an important avenue for future research on informant-ratings of mentally tough behaviours is to examine a triangulation approach across different assessors (e.g. parent, coach, peer) for the same target individual.

Fear of failure provided a dispositional sketch which speaks to a person’s motivational style or consistency in behaviour across situations and time. Typically, fear of failure leads to the adoption of avoidance-based goals and strategies such as self-handicapping that in turn exert a debilitative effect on variables such as effort expenditure, persistence, and performance attainment. Consistent with these expectations, fear of failure was inversely related with mentally tough behaviours thereby indicating that those players with a lower tendency to experience shame following failure are more likely to effectively manage challenges and demands as a tennis player over time.
Inspiration captures features of the context that energise and give rise to volitional control\(^\text{18,19}\). We found that players who experienced inspiration on a regular basis are more likely to behave in a mentally tough manner, yet the same cannot be said for the strength at which inspiration is experienced. This finding contrasts with previous research in which the relationships between the intensity and frequency dimensions of inspiration with important outcomes (e.g. intrinsic motivation, positive affect) are typically similar in strength\(^\text{18}\). The overlap (\(r = .86\)) between these two inspiration dimensions offers an explanation for this inconsistency; conceptually, adolescent athletes may not have easily distinguished between the two inspiration components. Additionally, whereas previous research has employed regression analyses that assume measurement is error free\(^\text{18}\), we explicitly modelled error via SEM thereby minimising the chance of biased parameter estimates\(^\text{29}\).

Passion provided an insight into a self-defining characteristic of athletes’ sense of who they are\(^\text{9}\). Those players who have internalised their strong inclination towards tennis in an autonomous manner such that it is important to their identity but not overpowering (i.e. harmonious passion) are more likely to be in control of their engagement of the activity, even though it occupies a central role in their life\(^\text{20}\). An increased sense of control over their engagement in tennis would create fewer conflicts with other important aspects in their life (e.g. school, relationships with family) and arguably place them in a better position to deal with the challenges they face as a tennis player. Consistent with these expectations, harmonious passion was associated with higher levels of mentally tough behaviours, whereas obsessive passion evidenced an inverse relationship.

**Conclusion**

Strengths of this study include the informant-rated measure of mentally tough behaviours (i.e. minimises concerns associated with common method bias), consideration of motivational orientations at different levels of one’s personality\(^\text{9}\), and the modelling of
measurement error within our analyses. Nevertheless, our study is not without limitation and these areas should be considered in future research. First, the cross-sectional nature of our design does not permit inferences regarding causality; experimental designs would prove fruitful in this regard. Second, we examined a small subset of motivational correlates; substantive insights will be gained by including cognitive (e.g. personal and relational efficacy perceptions), affective (e.g. intensity and directional interpretations of anxiety) and belief-based correlates (e.g. perceptions of whether mental toughness is considered immutable or malleable). Third, parents’ ratings of their child’s behaviours may have been influenced by social desirability or their own personality; for example, parents with high ego orientations who live vicariously through their child may report biased assessments. An examination of inter-rater consistency from multiple informant assessments (e.g. coach, peer, parent) would be informative. Finally, our focus on elite, emerging youth in an Australian context limits the extent to which these findings generalise to other populations. In summary, our findings revealed motivational orientations that are dispositional in nature, contextualised and contingent upon features of the situation or context, and concern one’s identity are important considerations for understanding mentally tough behaviours among adolescent tennis players.

**Practical Implications**

- when young athletes fail, reinforce aspects of their performance that were executed proficiently
- provide athletes with opportunities to experience inspiration on a more frequent basis
- reinforce aspects of tennis that players value, enjoy and find meaningful
Acknowledgments

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**References**


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


Table 1. Overview of McAdams and Pals’ (2006)\(^8\) integrative framework of personality psychology.

<table>
<thead>
<tr>
<th>Layer of Understanding</th>
<th>Definition</th>
<th>Elaboration and Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispositional Traits</td>
<td>“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).</td>
<td>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.</td>
</tr>
<tr>
<td>Characteristic Adaptations</td>
<td>“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).</td>
<td>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.</td>
</tr>
<tr>
<td>Life Stories or Personal Narratives</td>
<td>“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).</td>
<td>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.</td>
</tr>
</tbody>
</table>
Table 2. Item content and descriptive statistics for the informant measure of mentally tough behaviours.

<table>
<thead>
<tr>
<th></th>
<th>Item content</th>
<th>M</th>
<th>SD</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>My daughter/son consistently bounces back from setbacks</td>
<td>5.17</td>
<td>1.27</td>
<td>-0.59</td>
<td>0.26</td>
</tr>
<tr>
<td>2</td>
<td>My daughter/son works hard no matter what setbacks s/he encounters</td>
<td>5.81</td>
<td>1.18</td>
<td>-1.33</td>
<td>2.33</td>
</tr>
<tr>
<td>3</td>
<td>No matter how my daughter/son is feeling, s/he is able to perform to the best of her/his ability</td>
<td>5.61</td>
<td>1.38</td>
<td>-1.09</td>
<td>0.98</td>
</tr>
<tr>
<td>4</td>
<td>My daughter/son keeps performing well when challenged</td>
<td>5.56</td>
<td>1.18</td>
<td>-0.67</td>
<td>0.29</td>
</tr>
<tr>
<td>5</td>
<td>My daughter/son does what s/he needs to do to perform well</td>
<td>5.84</td>
<td>1.07</td>
<td>-1.18</td>
<td>2.09</td>
</tr>
<tr>
<td>6</td>
<td>My daughter/son refuses to give up when things get tough</td>
<td>5.89</td>
<td>1.25</td>
<td>-1.50</td>
<td>2.69</td>
</tr>
<tr>
<td>7</td>
<td>My daughter/son responds well to challenges</td>
<td>5.57</td>
<td>1.15</td>
<td>-0.85</td>
<td>0.89</td>
</tr>
<tr>
<td>8</td>
<td>My daughter/son is good at fighting for every point</td>
<td>5.71</td>
<td>1.33</td>
<td>-1.11</td>
<td>1.07</td>
</tr>
<tr>
<td>9</td>
<td>When things don’t go to plan, my daughter/son is good at changing the way s/he plays</td>
<td>5.08</td>
<td>1.25</td>
<td>-0.53</td>
<td>0.16</td>
</tr>
<tr>
<td>10</td>
<td>In general, my daughter/son is a good decision maker</td>
<td>5.33</td>
<td>1.30</td>
<td>-1.11</td>
<td>1.23</td>
</tr>
</tbody>
</table>
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).