The Motivational Antecedents of the Development of Mental Toughness: A Self-Determination Theory Perspective

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1   Abstract

2   Mental toughness is a topic that has received growing attention in psychological literature

3   over the past decade. Although some researchers have attempted to understand how mental

4   toughness is developed, little effort has been made to integrate an understanding of mental

5   toughness development with established psychological theory and research. The aim of our

6   review is to demonstrate the utility of theory and research on motivation for understanding

7   mental toughness and its development. In particular, we propose that self-determination

8   theory provides a sound basis for understanding the motivational antecedents of mental

9   toughness. To achieve our aim, we consider concepts that bridge mental toughness and self-

10   determination theory literature, namely *striving*, *surviving*, and *thriving*. We conclude our

11   review with suggestions for future lines of empirical enquiry that could be pursued to further

12   test our propositions.

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14   Key Words: Basic Psychological Needs, Psychological Need Thwarting, Autonomy Support,

15   Controlling Coaching, Athlete Development

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18   **Determination Theory Perspective.**

19   In sport, athletes who sustain unprecedented winning streaks, are victorious against all

20   odds, persist in the face of adversities, and, amongst other feats, come from behind to win are

21   often described as possessing some degree of *mental toughness* (MT). However, despite its

22   constant use in sport settings – not to mention more than a decade of research (Gucciardi &

23   Gordon, 2011) – an agreed upon understanding of MT remains elusive. As an example of this

24   ambiguity, Andersen (2011) highlighted that over 70 attributes, characteristics, behaviors,

25   constructs, cognitions, and emotions have been cited in past literature conceptualizing MT

26   (see Figure 1 for a representative list). Despite this conceptual ambiguity, researchers have

27   often defined MT similarly. In light of available empirical (Butt, Weinberg, & Culp, 2010;

28   Jones, Hanton, & Connaughton, 2002; Thelwell, Weston, & Greenlees, 2005) and conceptual

29   literature (Gucciardi, Gordon, & Dimmock, 2009), MT has commonly been defined as a

30   collection of personal characteristics that allow individuals to regularly attain and sustain

31   performances to the upper limits of their abilities. Why then might researchers define MT

32   similarly, yet conceptualize it differently? In answering this question and to foreshadow our

33   discussions, we suggest that MT may be less about *which* personal characteristics individuals

34   have at their disposal and more about *what* the personal characteristics individuals possess

35   allow them to do.

36   As MT has been associated with the collective processes that allow individuals to

37   pursue goals with effort and persistence, overcome the challenges of their goal pursuits, and

38   experience positive and adaptive experiences throughout their encounters (Bell, Hardy, &

39   Beattie, 2013; Gucciardi, Gordon, & Dimmock, 2009), we propose that MT can be

40   understood by the personal characteristics that facilitate human *striving*, *surviving*, and

41   *thriving* (we define and elaborate on these concepts in the following section). Whereas

42   researchers have previously tended to focus on these individual difference variables as

43   signature strengths of mentally tough performers, we believe the conceptual evolution of

44   mental toughness can benefit from an understanding of what these attributes mean for human

45   behavior. A synthesis of personal characteristics reported in past conceptualizations of MT

46   into themes of striving, surviving, and thriving is represented in Figure 1. Our synthesis

47   illustrates that the personal characteristics reported in previous conceptualizations of MT

48   often bridge more than one component of our tripartite reconceptualization. Nevertheless,

49   individuals may not need to possess all, but rather a combination of personal characteristics

50   in order to demonstrate behaviors consistent with notions of striving, surviving, and thriving.

51   Further to the discussions about *what* characterizes MT, is *how* it is developed.

52   Researchers have proposed a number of factors that contribute to the development of MT

53   (e.g., Connaughton, Hanton, & Jones, 2010; Gucciardi, Gordon, Dimmock, & Mallett, 2009;

54   Weinberg, Butt, & Culp, 2011), but little effort has been made to synthesize this evidence in

55   a collective and comprehensive fashion. A synthesis of the antecedents of MT would provide

56   further insight into those personal characteristics that are more common and central to

57   conceptualizing this concept. One possibility is to consider MT development in light of

58   established theory and research from broader areas of psychological enquiry. We propose that

59   self-determination theory (SDT, Deci & Ryan, 1985; Deci & Ryan, 2000) provides a sound

60   basis for understanding the motivational antecedents of MT. We also acknowledge that the

61   antecedents of MT might be understood in light other theories (e.g., the bioecological model

62   of human development, Bronfenbrenner & Morris, 2006), but present arguments for SDT

63   alone due to the notable links with previous MT research, because of the strong applied

64   implications of this theory, and, more broadly, to stimulate debate on the theoretical

65   underpinnings of MT. Further, considering the recent interest in MT in sport, but also in other

66   performance contexts such as surgery (Colbert, Scott, Dale, & Brennan, 2012) where high

67   performance is valued, we believe an understanding of MT and its development via

68   established theory is timely and will provide a foundation upon which to conduct further

69   research.

Delineating Between Striving, Surviving, and Thriving

71   For the purposes of this review, and in line with previous theory and research, we

72   define *striving* as efforts individuals expend on achievement tasks (Oettingen & Gollwitzer,

73   2001), *surviving* as effectively overcoming both major adversities as well as minor stressors

74   in the ongoing pursuit of goals (Luthar & Cicchetti, 2000), and *thriving* as growth through

75   daily lived experiences (Benson & Scakesm, 2009; Porath, Spreitzer, Gibson, & Garnett,

76   2012). We believe the concepts of striving, surviving, and thriving, whilst sharing some

77   conceptual space, are largely distinguishable from each other. For example, a golfer who sets

78   a short-term goal to chip three consecutive balls onto the practice green and succeeds at the

79   first attempt could be said to be striving without needing to survive hardships. A tennis player

80   might be effortful in her pursuits to master a challenging repertoire of strokes, but might not

81   necessarily feel energized during her performance or believe she has learned anything new if

82   she believes she's simply following instructions. Athletes on a rugby team who are winning

83   by a substantial margin might not be striving to score more points in the final stages of the

84   match, but might still be energized and/or successfully implementing a new team tactic (i.e.,

85   thriving). A soccer player might feel energized and alive (i.e., thriving) when participating in

86   his sport or learning new skills, but encounter only negligible challenges and, therefore, not

87   need to survive any particular hardships. An archer who missed the opportunity to compete at

88   a major event due to a poor performance during qualification might not be striving for

89   achievement goals immediately following his setback, but might still be surviving the

90   disappointment of his failure. Finally, an athlete who incurs an injury, overcomes the

91   associated emotional anguish, and returns to pre-injury levels of functioning personifies

92 surviving, but at the same time she might not feel energized towards her sport or sense she

93 has learned anything new (i.e., thriving).

94   We also argue that MT is characterized by the presence of all three concepts –

95 striving, surviving, and thriving – together. Previously, researchers (e.g., Clough, Earle, &

96 Sewell, 2002; Gucciardi, Gordon, & Dimmock, 2008; Jones et al., 2002) have been reluctant

97 to make such a claim. As such, we present conceptual arguments to support our contention

98 and align our points of view closely with our aforementioned definition of MT. Athletes who

99 are not striving for goal achievement, but still survive and thrive throughout their lived

100 experiences do not reflect MT because they are unlikely to attain performance standards

101 indicative of the upper limit of their abilities. Instead they might simply choose to engage in

102 what is of interest to them, but not necessarily of importance to achieving regular

103 performance standards. Similarly, athletes who strive for goal achievements and thrive

104 throughout their experiences, but are not able to survive hardships, do not reflect MT because

105 they too are unlikely to attain performance standards to the upper limit of their abilities.

106 Instead such individuals are restricted in their goal progressions because the fulfillment of

107 performance standards is intuitively linked with, at some stage, overcoming obstacles.

108 Finally, athletes who strive for goal achievements and survive hardships, but do not thrive

109 throughout their experiences, are not reflective of MT because they are unlikely to be able to

110 sustain their performance standards. Constant, intense effort with the added need to survive

111 hardships, coupled with perceptions of stagnation (i.e., not thriving), is likely to lead to

112 exhaustion and the resignation of goal pursuits. Notions of striving, surviving, and thriving

113 alone are important in their own right but are not sufficient to define MT, yet together they

114 provide an integrative framework for understanding the processes that allow individuals to

115 attain and sustain regular high performances despite circumstances faced.

116   Researchers have demonstrated links between notions of striving, surviving, and

117   thriving. For example, surviving hardships often result in enhanced perceptions of

118   competence, which promotes more effortful goal striving (Smith, Ntoumanis, Duda, &

119   Vansteenkiste, 2011). Similarly, feelings of vitality and the perception that one is learning

120   (i.e., thriving), compared to feelings of stagnation and boredom, often promote striving

121   because of the lack of barriers to and during goal pursuits (Spreitzer & Sutcliffe, 2007). This

122   interaction is reciprocal. That is, because of the personal meaning goal pursuits can bring to

123   individuals' lives, individuals who are striving often report higher levels of thriving (Sheldon

124   & Elliot, 1999; Smith, Ntoumanis, & Duda, 2007).

125   **A Brief Overview of SDT**

126   Self-determination theory (Deci & Ryan, 1985, 2000) is a meta-theory of human

127   motivation that considers the degree to which individuals' actions are freely chosen and

128   enacted (i.e., self-determined) versus controlled. SDT comprises five mini-theories, one of

129   which is particularly applicable to our reconceptualization of MT, namely basic

130   psychological needs theory (Ryan, Sheldon, Kasser, & Deci, 1996). Within this mini-theory

131   the degree to which three psychological needs – autonomy, competence, and relatedness – are

132   satisfied is purported to influence the extent to which individuals will undergo positive

133   psychological growth and development. Autonomy refers to the perception that one's actions

134   are volitional; competence is the belief that one is effective in a particular task endorsed by

135   the person; and relatedness refers to the perception that one is connected with wider social

136   structures.

137   A central tenet of SDT is that the satisfaction or thwarting of psychological needs is

138   contingent on the social contextual factors that surround them. Environments that nurture

139   individuals' needs for autonomy, competence, and relatedness are likely to enhance

140   perceptions of these fundamental psychological needs and, consequently, promote growth

141   and development. Although supportive of all three needs, researchers have typically referred

142   to such environments as autonomy-supportive (Deci & Ryan, 2012). According to Mageau

143   and Vallerand (2003), autonomy-supportive environments are characterized by the provision

144   of choice, rationales for task involvement, the acknowledgement of feelings, opportunities for

145   independent learning, and the acknowledgement of negative feelings. Conversely, social

146   contextual factors that undermine psychological needs (controlling environments) are likely

147   to thwart perceptions of autonomy, competence, and relatedness and, consequently, result in

148   stagnation and restrictions of psychological growth and development. Controlling

149   environments are characterized by the manipulation of behaviors through the provision of

150   tangible rewards, the use of contingent feedback, actions and/or locutions that communicate

151   personal control, intimidating behaviors, the promotion of ego-involvement, and the

152   provision of conditional regard (for a review see, Bartholomew, Ntoumanis, & Thogersen-

153   Ntoumani, 2009).

SDT and MT Development

155   We argue that the theoretical underpinnings of SDT make it an attractive backdrop

156   from which to consider MT development. Some authors have speculated that MT

157   development might be underscored by constructs consistent with SDT (e.g., Gucciardi &

158   Mallett, 2010; Mallett & Coulter, 2011), however, to our knowledge, a detailed integration of

159   literature across these research fields has not yet been undertaken. Further, the factors that

160   researchers have previously identified as contributing to MT development share similarities

161   with SDT principles. For example, Gucciardi, Gordon, Dimmock, and Mallett (2009)

162   reported that coaches can facilitate MT development in their athletes by forming trusting,

163   respectful, and positive relationships (i.e., attending to relatedness), designing challenging

164   and pressure-filled activities (i.e., attending to competence), and involving athletes in their

165   preparation and competition (i.e., attending to autonomy). These researchers also suggested

166   that being success-oriented, setting unrealistic or unchallenging activities, and ignoring

167   and/or neglecting athletes in their preparation and competition forestalls MT development.

168   Beyond initial indications that MT and SDT are associated, there are conceptual

169   grounds to support our contentions. Of foremost importance to our review is the conceptual

170   premise that we believe binds MT and self-determination research, namely the notion of self-

171   actualization (i.e., the fulfillment of one's potentials; Maslow, 1943). Mental toughness is

172   arguably a process that underscores self-actualization, where self-actualization concerns the

173   degree to which individuals fulfill their psychological heights and reflects human growth and

174   development (Maslow, 1943). In identifying a connection between MT and self-actualization,

175   we also acknowledge that the latter is bound to other notions such as morality and altruism

176   and so MT is not wholly, but rather partly, indicative of self-actualization. Self-actualization

177   has been theorized and evidenced to be predicated on by the satisfaction of psychological

178   needs (Deci & Ryan, 2000; Ryan, Curren, & Deci, 2013). In light of these conceptual binds,

179   we review evidence that supports our contention that the degree to which psychological needs

180   are satisfied precedes MT development and is indicative of self-actualization. We aim to

181   illustrate how autonomy-supportive environments might contribute to the development of

182   MT through the satisfaction of psychological needs. We also aim to evidence that the

183   undermining of psychological needs, emanating from controlling environments, is likely to

184   inhibit MT development (see Figure 2). As mentioned above, to support our arguments we

185   will focus on notions of striving, surviving, and thriving as representative of MT and detail

186   how components of SDT are foundational to the development of these three concepts.

187   **Striving**

188   Drawing on broader psychological literature, striving refers to the efforts individuals

189   expend on achievement tasks (Oettingen & Gollwitzer, 2001). Both the quality and quantity

190   of effort individuals expend is positively related to goal attainment (Sheldon & Elliot, 1999;

191   Silvia, McCord, & Gendolla, 2010). Also, central to the notion of striving is the distinction

192   between individuals' intensity and duration of effort. Because of the positive associations

193   between intensity and duration of effort and goal achievement (e.g., Yeo & Neal, 2004), we

194   suggest that mentally tough individuals are those who maintain a high level of intensity over

195   a prolonged duration. Conceptual elements reported in previous MT research appear to

196   resonate with notions of high, sustained effort, including pushing physical boundaries (Bull,

197   Shambrook, James, & Brooks, 2005; Jones et al., 2002; Jones, Hanton, & Connaughton,

198   2007), working hard (Bull et al., 2005; Butt et al., 2010; Coulter, Mallett, & Gucciardi, 2010;

199   Gucciardi et al., 2008), remaining focused on a task (Jones et al., 2002, 2007; Thelwell et al.,

200   2005), and persisting through obstacles (Coulter et al., 2010; Gucciardi et al., 2008; Jones et

201   al., 2002, 2007; Thelwell et al., 2005). Actions that are initially effortful, but not sustained

202   across repeated occasions are not indicative of MT because they are unlikely to allow

203   individuals to regularly attain and sustain performance standards (Silvia et al., 2010).

204   Key aspects of SDT pertinent to our reconceptualization of MT have been associated

205   with sustained effort (e.g., Ntoumanis, 2001; Pelletier, Fortier, Vallerand, & Brière, 2001).

206   Findings from this body of research reveal that individuals whose psychological needs are

207   satisfied are more likely to pursue goals with greater sustained efforts than those whose needs

208   are thwarted. Psychological needs satisfaction precedes individuals' sustained efforts

209   (Vallerand, 1997) because of the internalized perceptions of causality, the belief in skills and

210   abilities, and the sense of social connectedness that emanates from such individuals (Deci &

211   Ryan, 2000). As an example, a hurdler is more likely to sustain her efforts if she believes her

212   actions will affect task outcomes, her skills and abilities are efficacious for achieving task

213   goals, and others support and encourage her during her pursuits. In contrast, individuals are

214   likely to commit less effort over time or forfeit their efforts altogether if their psychological

215   needs are undermined (Bartholomew et al., 2009). Explaining this point, individuals whose

216   psychological needs are thwarted believe their actions are dictated to by external sources

217   (e.g., coach demands), perceive their skills and abilities as being undermined through

218   coercive actions or locutions, and feel bullied or ostracized by others.

219   In addition to this body of research, Sheldon and Elliot's (1999) self-concordance

220   model of goal pursuits (embedded within SDT) illustrates links that support our contentions.

221   Specifically, Sheldon and Elliot proposed that autonomous (i.e., self-selected) goals are

222   pursued with sustained effort because such goals are likely to be aligned with individuals'

223   developing interests and deep-seated values. Consequently, Sheldon and Elliot showed that

224   sustained effort results in goal attainment. In contrast to autonomous goals, individuals who

225   pursue goals for controlled reasons are more likely to forfeit their efforts and goal

226   achievement, especially when faced with difficulties, because such goals hold little personal

227   meaning and are disconnected from individuals' interests. Smith, Ntoumanis, and Duda

228   (2007) have garnered support for Sheldon and Elliot's (1999) model in two studies with

229   British athletes. In these studies, athletes who reported setting autonomous goals were more

230   likely to sustain their efforts and achieve their goals compared to those who reported

231   controlled motives for goal selection. Importantly, Smith et al. found that athletes were more

232   likely to self-select goals if they also perceived that their coaches provided autonomy-

233   supportive environments, whereas controlled goals resulted from controlling coaching

234   environments. Taken together, the aforementioned findings highlighted that components of

235   SDT have utility for understanding the striving concept that we argue is indicative of MT.

236   **Surviving**

237   Notions of surviving have been evidenced in all previous conceptualizations of MT

238   (e.g., resilience, Gucciardi et al., 2008; handling failure and pressure, Jones et al., 2007; the

239   ability to hang on, Thelwell et al., 2005). Theory and research from diverse fields of

240   psychological enquiry support notions of surviving as central to the attainment and

241   sustainment of high performance, in particular, theory and research on coping and resilience.

242   Although coping and resilience concern individuals' responses following stressors or

243   adversities, MT is as much about these experiences as it is about how individuals respond to

244   successes, achievements, winning streaks, times of rest, and benign situations. Hence, we

245   argue that coping and resilience explain some, but not the entire concept of MT.

246   Performers who employ effective coping strategies to overcome situational demands

247   typically outperform those who employ ineffective coping strategies (Levy, Nicholls, &

248   Polman, 2011). Although such findings indicate meaningful links between coping and MT,

249   they also raise questions about what is considered effective coping. Researchers (Folkman &

250   Lazarus, 1985; Lazarus & Folkman, 1984) have proposed that individuals who appraise

251   stressors as *challenging* (i.e., individuals feel energized, ardent, and confident about being

252   able to overcome stressors) are more likely to interpret situations, their personal

253   characteristics, and their options as more controllable. In comparison, those who appraise

254   stressors as *threatening* (i.e., individuals anticipate damage to their physical or psychological

255   selves) or *harmful* (i.e., individuals perceive damage to their physical or psychological selves

256   as having occurred) are more likely to appraise situations, their personal characteristics, and

257   their options as less controllable. Individuals who appraise their experiences as more

258   controllable are likely to employ problem-focused coping strategies (e.g., planning, effortful

259   actions), whereas those who appraise their experiences as less controllable are more likely to

260   employ emotional-focused coping strategies (e.g., distancing, rationalizing). Neither one of

261   these coping strategies is viewed as inherently superior to the other (Lazarus & Folkman,

262   1984). Instead, the effectiveness of particular coping strategies is dependent on intra- and

263   inter-individual differences.

264   Evidence from research on MT appears to align with coping literature. Specifically,

265   mentally tougher athletes have been described as those who use both problem-focused coping

266   (e.g., competitive effort, Coulter et al., 2010; pushing self, Jones et al., 2007) and emotion-

267   focused coping strategies (e.g., emotional intelligence and control, Coulter et al., 2010;

268   accepting anxiety and coping, Jones et al., 2002). Further, mentally tough individuals have

269   been described as those who have a superior knowledge of their performance contexts and

270   their emotional experiences (Gucciardi, Mallett, Hanrahan, & Gordon, 2011). Arguably, it is

271   this knowledge that allows mentally tougher individuals to select the coping strategy (either

272   problem- or emotion-focused) that is most likely to facilitate regular attainment and

273   sustainment of performance standards.

274   Autonomy-supportive environments are theorized to directly, as well as indirectly

275   predict effective coping via the satisfaction of individuals' psychological needs (Ntoumanis,

276   Edmunds, & Duda, 2009). Such theorizing complements our contention that surviving is

277   fostered through concepts central to SDT. Individuals exposed to autonomy-supportive

278   environments are more likely to appraise stressors as challenging because they are afforded

279   opportunities to freely express their feelings, garner guidance and advice, and meet demands

280   with the support of others, whilst not being exposed to hostility, coercion, and/or judgment

281   (Ntoumanis et al., 2009). For example, a golfer is more likely to view a poor mid-tournament

282   round as an opportunity to grow, learn, and re-apply skills if his coach listens to his worries,

283   offers guidance, and encourages him to meet the demands of the next round. In comparison,

284   individuals exposed to controlling environments are more likely to appraise stressors as

285   threatening and/or harmful because their surrounding social contexts offer little reprieve from

286   the anticipated and feared damages associated with the stressor (Ntoumanis et al., 2009). For

287   example, a golfer who is belittled, made to feel embarrassed, ignored by his coach, and told

288   what to do following a poor mid-tournament round will be more likely to resign his efforts

289   and forfeit his performance goals due to the perceived fear of, or the inability to escape,

290   damage to his self-esteem.

291   Theory and research on resilience is also pertinent to the concept of surviving –

292   indeed, resilience itself is a personal resource reported in a number of previous MT

293   conceptualizations (e.g., Gucciardi et al., 2008; Jones et al., 2007). Resilience is defined as

294   individuals' abilities to experience positive adaptations or maintain healthy levels of physical

295   and psychological functioning following experiences of adversity (Lepore & Revenson,

296   2006; Luthar & Cicchetti, 2000). Resilient individuals are often described as those who

297   remain unaffected or return to usual levels of functioning following the experience of

298   adversity (Luthar & Cicchetti, 2000). These views are echoed in research that has

299   conceptualized mentally tough individuals as those able to resist (e.g., dedication and

300   commitment, Bull et al., 2005; focus despite distractions, Jones et al., 2002; ignore

301   distractions, knowing how to persist through obstacles, the ability to hang on, Thelwell et al.,

302   2005) and recover (bounce back from setbacks, regain psychological control, Jones et al.,

303   2002; react positively, Thelwell et al., 2005) following major upheavals and minor

304   challenges. Seemingly, resilience is inherently linked with the ability to maintain

305   performance standards. That is, following adversities, resilient individuals are those who

306   continue to pursue performance standards with little or no interruption. The link between

307   resilience and performance has been reported in empirical research. For example, Seligman,

308   Nolen-Hoeksema, Thornton, and Moe Thornoton (1990) showed that swimmers who were

309   rated as more resilient by their coach performed better following adversities compared to less

310   resilient individuals (also see, Fletcher & Sarkar, 2013).

311   Literature on resilience can also be used to illustrate how each of the three needs

312   proposed by SDT underscore the development of the surviving component of MT.

313   Specifically, autonomous athletes are more likely to perceive their actions as the catalyst for

314   change (Deci & Ryan, 2000) and, as such, are arguably more likely to engage in behaviors

315   directed towards making performance gains following adversities. For example, a tennis

316   player who loses her tour privileges because of poor performances is not only more likely to

317   continue to commit to her training and competitions, but also attempt to develop a stronger

318   skill set if she endorses her actions. In comparison, a tennis player who believes sources other

319   than herself determine her behaviors and outcomes is more likely to retire her efforts after

320   losing her tour privileges or commit to training and competition for non-self-determined

321   reasons (e.g., 'shoulds' and 'musts'). In such a case, the athlete's actions limit the likelihood

322   that positive adaptations will occur.

323   Competent individuals also personify resilience because they perceive their actions as

324   efficacious in overcoming the adversities they encounter (Fletcher & Sarkar, 2013). For

325   example, upon returning from a long-term injury, a baseball player who perceives he is

326   competent is more likely to attempt to advance his skills further by pursuing goals that

327   challenge his current abilities because he feels able to bring about desired outcomes by

328   personal means. In comparison, a baseball player who returns from a long-term injury and

329   perceives himself as incompetent is more likely to engage in easier, less challenging activities

330   and avoid opportunities for growth, meaning he is limiting the likelihood of positive

331   adaptations occurring following the experience of adversity.

332   Finally, individuals who perceive themselves as connected with their wider social

333   networks are more likely to experience positive adaptations following adversities because

334   they are supported in their attempts to reestablish their levels of performance, functioning,

335   and development (Galli & Vealey, 2008; Hjemdal, 2007). As an example, a boxer who loses

336   the first rounds of a bout is more likely to direct her actions towards improving her

337   performances in subsequent rounds if she perceives strong support and encouragement from

338   her coach and trainers. She is likely to act this way because she knows that she will receive

339   unconditional support from those around her regardless of the outcome of the bout. In

340   comparison, a boxer who views herself as being bullied and ostracized by her coach and

341   trainers is more likely to engage in low risk behaviors (e.g., avoid delivering potential knock-

342   out punches) following a losing opening round to avoid further social torment from

343   significant others.

344   To conclude, as with striving, research has shown that the provision of autonomy-

345   supportive environments promotes individuals' perceptions of need satisfaction and, in turn,

346   encourages effective coping and resilience (i.e., surviving). In comparison, controlling

347   environments that thwart individuals' psychological needs are likely to undermine

348   individuals' abilities to survive hardships. As such, components central to SDT are useful for

349   understanding how the surviving concept of MT is developed.

350   **Thriving**

351   Thriving has been described as an everyday experience where individuals not merely

352   survive, but grow through their daily, lived experiences (Benson & Scakesm, 2009; Porath,

353   Spreitzer, Gibson, & Garnett, 2012). Thriving is conceptualized as comprising two

354   dimensions: feelings of vitality (i.e., a sense that one is energized; a zest for the task at hand;

355   Porath et al., 2012) and a sense that learning is occurring (Spreitzer, Sutcliffe, Dutton,

356   Sonenshein, & Grant, 2005). Mental toughness has been conceptualized as thriving on

357   pressure (Jones et al., 2002), thriving on competition (Bull et al., 2005), enjoying pressure,

358   and being in control of one's life (Thelwell et al., 2005). Arguably, these conceptual

359   properties reveal mentally tough individuals as those who do not merely survive hardships,

360   nor make gains through periods of rest alone; these individuals are more often than not

361   experiencing a heightened sense of vitality and feel as though they are mastering new

362   knowledge, skills, and abilities. Further, context intelligence, that is the acquirement and

363   application of knowledge and skills reported in previous MT conceptualizations (e.g.,

364   Gucciardi et al., 2011), aligns with the learning dimension of thriving. Illustrating these

365   arguments with an example, a mentally tough weightlifter would be one who is energized and

366   enthusiastic about participating in her sport, whilst also sensing that she is acquiring and

367   applying new skills, abilities, and knowledge about her performances.

368   In further support of the value of thriving for understanding MT, individuals who

369   experience ongoing thriving are likely to attain and sustain regular performance standards

370   (Porath et al., 2012; Spreitzer & Sutcliffe, 2007). Individuals who are thriving have also been

371   suggested to commit to performance tasks, practice initiative taking, and be proactive (Porath

372   et al., 2012; Spreitzer & Sutcliffe, 2007). These findings align with evidence from MT

373   research that has emphasized the role of valuing hard work (Bull et al., 2005; Gucciardi et al.,

374   2008), attending to task-cues and ignoring distractions (see, Gucciardi et al., 2011), taking

375   risks (Bull et al., 2005; Coulter et al., 2010), and making the most of opportunities (Bull et

376   al., 2005). As an example, a triathlete who is thriving works hard towards his goals and

377   attempts to advance his knowledge of his sporting domain by taking calculated risks. A

378   triathlete who is not thriving is less confident and committed to his goals, easily distracted,

379   and cautious in his actions.

380   Researchers (Ryan et al., 2013; Spreitzer & Porath, 2013) have evidenced that

381   thriving is facilitated by mechanisms consistent with SDT (this is particularly true when one

382   considers thriving is often described as reflecting well-being, e.g., Ryan, Bernstein, & Brown,

383   2010). In particular, when individuals' psychological needs are satisfied, they are more likely

384   to undergo psychological growth and development (Deci & Ryan, 2000). This growth and

385   development is representative of a progression toward self-actualization – or reaching one's

386   full psychological potentials. Not surprisingly then, when individuals are progressing towards

387   self-actualization they emanate considerable psychological energy (e.g., enthusiasm,

388   aliveness). It is this energy that is reflective of feelings of vitality (Deci & Ryan, 2000; Ryan

389   et al., 2013; Spreitzer & Porath, 2013). Researchers have also shown that individuals'

390   energies are maintained and enhanced when their psychological needs are satisfied, and

391   depleted when their needs are undermined (Gagné, Ryan, & Bargmann, 2003; Nix, Ryan,

392   Manly, & Deci, 1999; Ryan et al., 2010; Vansteenkiste, Simons, Lens, Sheldon, & Deci,

393   2004).

394   Researchers have also illustrated the role social contextual factors play in facilitating

395   the relationship between psychological needs and vitality. Specifically, autonomy-supportive

396   environments have been found to enhance perceptions of vitality through psychological needs

397   satisfaction, whilst the contrary is true of controlling environments (Gagné et al., 2003; Ryan

398   et al., 2010; Vansteenkiste et al., 2004). Thus, it is reasonable to contest that thriving, as one

399   underlying notion consistent with MT, is fostered through the satisfaction of individuals'

400   psychological needs in autonomy-supportive environments.

401   Although a strong link has been evidenced between SDT and feelings of vitality,

402   support for links between SDT and Spreitzer et al.'s (2005) second facet of thriving, the sense

403   that learning is occurring (Spreitzer & Sutcliffe, 2007), is less discussed in the extant

404   literature. Nevertheless, some researchers have indicated that those individuals whose

405   psychological needs are satisfied are more likely to engage in behaviors that are

406   representative of a sense that learning is occurring. For example, individuals whose

407   psychological needs are satisfied self-guide practice during 'free-choice' periods (i.e., a time

408   when individuals can engage in self-chosen tasks), compared to those whose psychological

409   needs are undermined (Ryan, Koestner, & Deci, 1991; Vansteenkiste et al., 2004). Further,

410   individuals who are exposed to autonomy-supportive social contexts are more likely to

411   evidence deeper levels of processing, whereas those exposed to controlling environments are

412   more likely to report only surface level processing (Vansteenkiste et al., 2004).

413   Taken together, the aforementioned findings illustrate that individuals' perceived

414   satisfaction of psychological needs, enhanced through the provision of autonomy-supportive

415   environments, predicts thriving. Further, thriving is likely to be inhibited when individuals'

416   psychological needs are thwarted as a result of being exposed to controlling environments.

417   As such, components central to SDT are useful for understanding how the thriving concept

418   consistent with our MT reconceptualization is developed.

Conclusions

420   Unique to our review is our tripartite MT reconceptualization (i.e., striving, surviving,

421   and thriving). Our reconceptualization represents a theory-based attempt to address

422   disagreements evident in previous research by directing the focus away from the collection of

423   personal characteristics that comprise MT and instead focusing on what the personal

424   characteristics individuals possess allow them to do. In so doing we have argued that MT is

425   indicative of how athletes strive, survive, and thrive in their ongoing pursuits of performance

426   standards. Despite this novel contribution to the literature, there is a need to empirically

427   substantiate our contention that striving, surviving, and thriving serve as a useful unifying

428   reconceptualization for MT. One approach would be to identify if established measures of

429   striving, surviving, and thriving load meaningfully onto a general factor of MT and explore

430   the shared variance between these factors. Beyond factorial analysis of these concepts,

431   researchers could experimentally manipulate variables such as pressure to examine if our

432   tripartite reconceptualization distinguishes those individuals who sustain performance

433   standards across low and high pressure conditions, with individuals who succumb to the

434   pressure manipulation and perform worse.

435   Also unique to our review is the consideration of the motivational antecedents of MT

436   using a SDT lens. Specifically, we contested that striving, surviving, and thriving – as

437   representative of qualities reported in previous MT research – are predicted by the degree to

438   which individuals' psychological needs are satisfied through the provision of particular social

439   contextual factors. Specifically, we argued that autonomy-supportive environments facilitate

440   MT development through the provision of needs satisfaction and autonomous goal striving,

441 whereas controlling environments thwart MT development through the undermining of

442 individuals' psychological needs and the promotion of controlled goal striving. It is necessary

443 to acknowledge that SDT is only one lens through which to consider MT development. In the

444 future, the consideration of other theoretical frameworks outside the motivation literature

445 (e.g., the bioecological model of human development, Bronfenbrenner & Morris, 2006)

446 would be fruitful for composing a comprehensive understanding of MT development.

447 Our contentions also hold practical value for individuals invested in the development

448 of athletes. For example, coaches could attempt to provide autonomy-supportive training

449 environments, whilst avoiding the use of controlling sanctions, to nurture psychological

450 needs and encourage striving, surviving, and thriving in their athletes. We believe that the

451 ideas we have presented offer researchers and individuals such as coaches new insights into

452 MT and its development, as well as promote future research along these lines.

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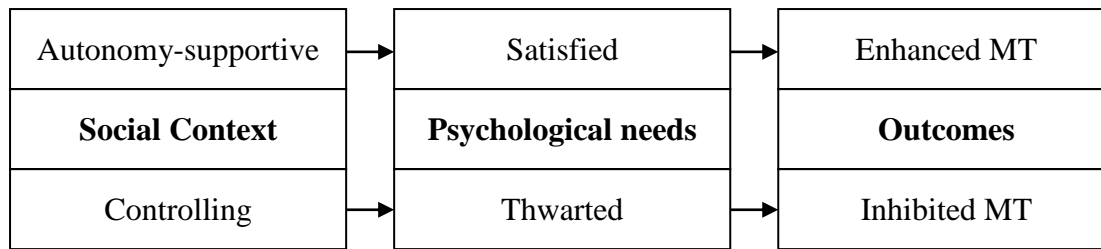
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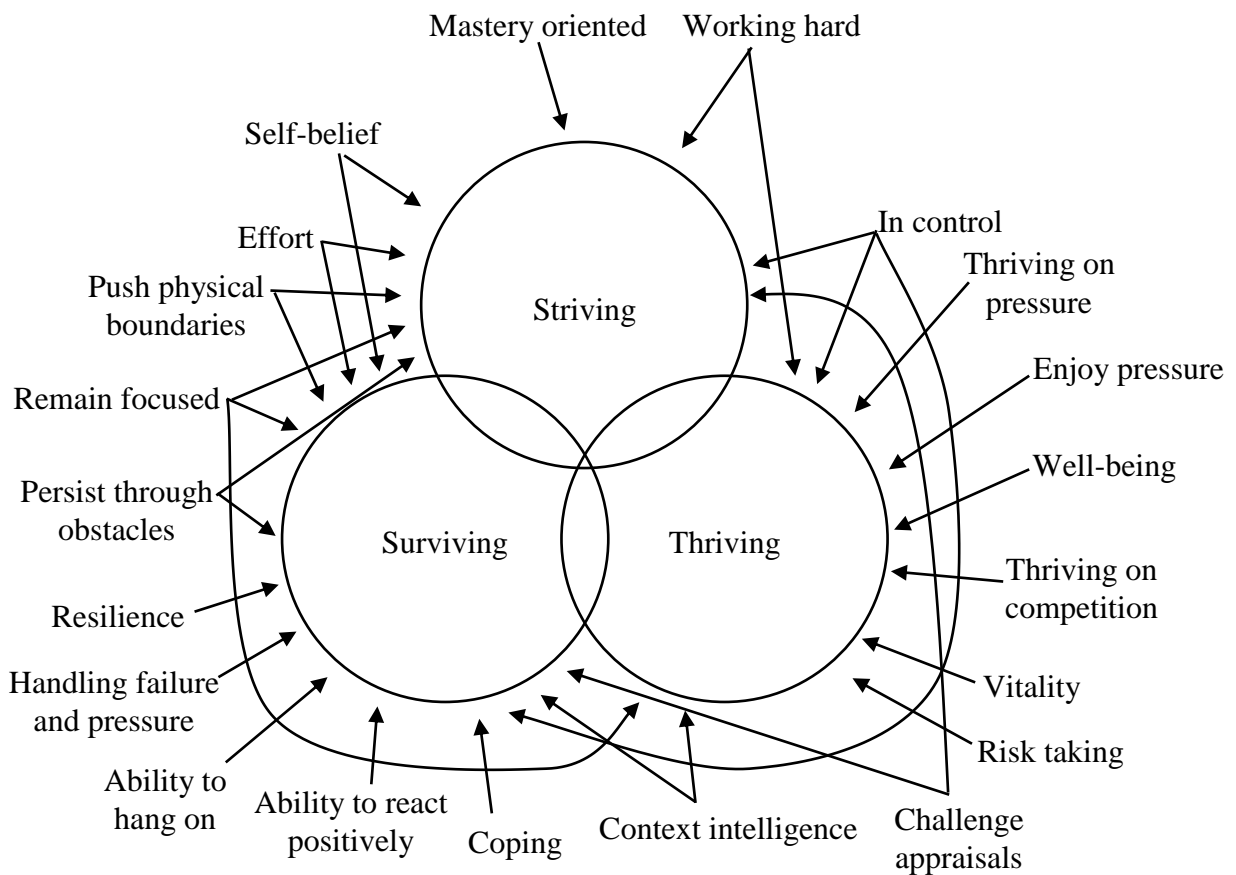
Figure 1. A synthesis of prominent previous conceptualizations of MT (Bull et al., 2005; Butt et al., 2010; Clough, Earle, & Sewell, 2002; Coulter et al., 2010; Gucciardi & Gordon, 2009; Gucciardi et al., 2008; Jones et al., 2002, 2007; Thelwell et al., 2005) into notions of striving, surviving, and thriving

Autonomy-supportive	→	Satisfied	→	Enhanced MT
Social Context		**Psychological needs**		**Outcomes**
Controlling	→	Thwarted	→	Inhibited MT

Figure 2. Motivational antecedents of the development of MT: A SDT perspective.