

## Mental toughness in elite and sub-elite female soccer players

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### Abstract

Mental toughness (MT) is seen as an important psychological factor in the athletic success of elite athletes. Research on the subject has usually concerned male athletes. Our purpose was to investigate whether there are differences in mental toughness between female players who compete in an elite league and those who play at lower levels. In total, 298 female soccer players (M = 20.7 years, SD = 3.7 years) from three levels of Norwegian soccer responded to the Sports Mental Toughness Questionnaire. The MT Constancy subscale was removed from analysis due to an unacceptable Cronbach alpha (0.57). The results revealed that elite league players had significantly higher MT Global scores than those in lower leagues. The elite players had higher scores than the third league players on the MT Confidence subscale. For MT Control, the elite league players had a significantly higher score than the second league players, but the elite players did not differ significantly from the third league players on this subscale. These results partially confirm a relationship between mental toughness and playing level among female soccer players.

Key words: elite, team sport, football, psychology skills, women

### Introduction

Years of systematic physical, technical, and tactical practice and play are required to reach the elite level in soccer (Haugaasen, Toering, & Jordet, 2014). In addition, distinct general psychological attributes have been identified as important explanatory factors of athletic performance (Gould, Dieffenbach, & Moffett, 2002; Gucciardi & Gordon, 2009; Morgan, 1980; Orlick & Partington, 1988; Sheard, 2010) and soccer ability. Nesti (2010) claims that professional players exhibit vigorous mental skills, such as concentration, self-confidence, and

a winner's mentality. Almost 30 years ago, Gould, Hodge, Peterson, and Petlichkoff (1987) introduced mental toughness as a term that coaches commonly use to refer to the mental attributes that determine athletic success, whereas negative outcomes resulted from the lack of it (Gould et al., 1987; Hodge, 1994; Tunney, 1987). In the soccer domain, Thelwell, Weston, and Greenless's (2005) study of six professional male soccer players reported that their mental toughness had always helped them cope more efficiently.

Whilst the term "mental toughness" is intuitively appealing and has high face validity within the community of coaches and athletes, in the field of academic sport psychology there has been some disagreement regarding the definition and conceptualization

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of the construct. Despite this, Gucciardi and Gordon (2009) claim that researchers have made important progress in clarifying taxonomies of its key characteristics. In general, mental toughness seems to reflect attributes such as resilience, confidence, commitment, self-belief, concentration, and the ability to cope with (or even thrive on) pressure (Dewhurst, Anderson, Cotter, Crust, & Clough, 2012). One definition of mental toughness that seems to be commonly used is the following:

“having the natural or developed psychological edge that enables you to: generally, cope better than your opponents with the many demands (competition, training, lifestyle) that sport places on a performer. Specifically, be more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure.” (Jones, Hanton, & Connaughton, 2002, p. 209)

In an attempt to conceptualize mental toughness Sheard, Golby, and van Wersch (2009) identified three primary components, which are: confidence (i.e., an athlete's general belief in his/her ability to achieve his/her goals and that he/she is different and better than his/her opponent in challenging and pressured situations), constancy (i.e., the determination to take responsibility for setting goals and meeting the demands of training and competition) and control (i.e., an athlete's perception that he/she has control over the situation and can bring about a desired outcome).

Mental toughness is commonly viewed as a skill developed at least partly through practice rather than an inherited ability (Gucciardi & Gordon, 2011; Jones et al., 2002; Thelwell et al., 2005), and it affects the way athletes deal with pressure, challenges, and adversity. In a study of head coaches at the NCAA level, the coaches highlighted mental toughness as a key skill component of the sport. Moreover, they try to recruit athletes who are mentally tough and deliberately build mental toughness in their athletes (Weinberg, Butt, & Culp, 2012). According to Thelwell et al. (2005), elite

soccer players are mentally tough and professional in everything they do; they never give up, and they are thorough, confident and focused, which makes them able to cope with the various challenges of soccer. In periods of transition, these attributes are crucial. Consistent with this view, Coulter, Mallett, and Gucciardi (2010) suggest that mental toughness is probably necessary from an early age and that it is especially necessary for the transition from junior to senior elite soccer. In general, research has emphasized that mental toughness is a mind-set related to achievement level (Gucciardi & Gordon, 2011), so we would expect players who have mastered their periods of transition and playing at the elite level to be mentally tougher. Based on coaches' and athletes' emphasis on mental toughness as a performance discrimination variable, one could expect substantial research effort, but as Nicholls, Polman, Levy, and Backhouse (2008) note, there is scant research on the relationship between achievement level and mental toughness, and the findings are equivocal. In a study of Korean female athletes, Shin and Lee (1994) reported that elite athletes were more mentally tough than their non-elite counterparts, whereas Mazaulan and Rahim (2014) showed a significant negative relationship between mental toughness and sport performance among contact and non-contact Malaysian athletes. Newland, Newton, Finch, Harbke, and Podlog (2013) explored the relationship between mental toughness and performance among college basketball players. Their findings indicated that basketball performance was partially predicted by mental toughness and starting status. Surprisingly, mental toughness helped to explain the variance in basketball performance of the male players but not the female players, for whom only starter status predicted performance. Furthermore, in Nicholls, Polman, Levy, and Backhouse's (2009) study, which included a comprehensive range of sports, athletes at higher achievement levels were not mentally tougher; this finding seems to support the finding of Golby and Sheard (2004) that other factors such as physical attributes, skills, and psychological variables predict achievement level more accurately.

Although mental toughness has received growing attention in the field of sport psychology, most studies have a limited (and sometimes sole) focus on male athletes. Therefore, more research regarding female athletes' mental toughness is warranted because previous research has detected gender differences in personal characteristics such as mental toughness. In a study by Nicholls et al. (2009), male athletes scored significantly higher than females on all mental toughness subscales (e.g. challenge, control emotions, control life, and confidence in ability). According to Gallucci (2014), sport-specific confidence may be less stable for females than for males. Furthermore, in Jones and Cale's (1989) study, female athletes had more cognitive anxiety than male athletes. In line with this, Jones, Swain, and Cale (1991) reported gender differences related to cognitive anxiety—female athletes were shown to worry more about reaching their competition goals and being sufficiently prepared than male athletes, who were more concerned about the strength of the competition and its outcome.

Although the study by Shin and Lee (1994) examined mental toughness among female athletes, to our knowledge few studies have been carried out in soccer and none of these has exclusively examined mental toughness in female players. Therefore, the primary aim of this study was to investigate mental toughness among female soccer players at different playing levels. More specifically, the following hypothesis is proposed for testing:

Elite female soccer players score significantly higher on all mental toughness measurement scales than sub-elite players (second and third league players)

## Method

### Participants

Two hundred and ninety eight female soccer players, (Norwegian elite league 96 players with a mean age of 22.2 years,  $SD = 4.0$ ), second league (80 players with a

mean age of 19.4 years,  $S = 2.5$ ) and third league (122 players with a mean age of 20.3 years,  $SD = 3.7$ ) participated in this study. The sample represents approximately 40% of all players in the elite and second leagues, and 20% of the players in selected regions in the third league.

### Procedure

All the coaches in the elite and second leagues were contacted by telephone and asked to participate in this study. In the third league, we randomly selected the coaches in five of the seven districts to be contacted. Coaches who agreed to participate received written information about the project, including a questionnaire to be distributed to the players on their teams. The coaches were instructed to distribute the questionnaires after a training session and have each player return her completed questionnaire in a sealed envelope. Each coach then returned the players' envelopes to the first author. Three coaches declined to participate (one elite team and two third league teams). Their explanation for declining was their own and the athletes' workload. Ethical approval was obtained as required by the first author's university.

### Measures

**Mental Toughness.** To measure mental toughness (MT), we used the Sports Mental Toughness Questionnaire (SMTQ; Sheard, 2010; Sheard et al., 2009), which consists of 14 items that comprise MT Global, an overall measure of MT. The SMTQ has three subscales. The first subscale, MT Confidence, measures an athlete's general belief in his/her ability to achieve his/her goals and that he/she is different and better than his/her opponent in challenging and pressured situations. An example item is, "I interpret potential threats as positive opportunities." The second subscale, MT Constancy, measures the determination to take responsibility for setting goals and meeting the demands of training and

competition, as well as the possession of an unyielding attitude and the ability to concentrate, show grit, and not give up in the face of adversity. A sample item is “I take responsibility for setting myself challenging targets.” The third subscale, MT Control, measures an athlete’s perceptions that he/she has control over a situation and can bring about a desired outcome, as well as the ability to keep emotions under control and to remain calm and relaxed in pressured situations. An item example is, “I worry about performing poorly” (reverse coded).

Participants respond to the SMTQ items on a four-point Likert-type scale that ranges from 1 (*not at all true*) to 4 (*very true*). Cronbach’s alphas in the present study were .71 for MT Confidence, .57 for MT Constancy, .74 for MT Control and .75 for MT Global. The alphas were therefore deemed ‘respectable’ except for MT Constancy that was deemed ‘unacceptable’ according to DeVellis (2012,) and none of the alphas could be further improved through appropriate subscale item pruning techniques (DeVellis, 2012). The MT Constancy subscale was therefore excluded from further subscale analyses.

## Data analyses

Data were first screened for outliers and normality. The internal consistency of the SMTQ and descriptive statistics were calculated prior to statistical analysis. We conducted a Pearson correlation between the mental toughness variables and a separate univariate analysis of variance (ANOVA) for the MT Global by playing level. Finally, one multivariate analysis of variance (MANOVA) with Tukey HSD tests for post hoc comparisons was used to investigate whether achievement level was associated with differences in the two remaining MT subscales (MT Confidence, MT Control).

## Results

Means, standard deviations, inter-subscale correlations

and paired sample t-test results for the Global scale and its two retained subscales are shown in Table 1.

**Table 1.** Descriptive Statistics and Bivariate Correlations between All MT Variables

Variables	M (SD)	MT Control	MT Global
MT Confidence	2.74 (.43) <sup>a</sup>	.24**	.73**
MT Control	2.34 (.69) <sup>a</sup>		.75**
MT Global	2.76 (.37)		

Note: MT, mental toughness; M (SD), mean (standard deviation); \*  $p < .05$ , \*\*  $p < .01$ ,  
<sup>a</sup>statistically significant difference ( $p < .001$ ) between subscales (paired sample t tests)

A one-way ANOVA detected a statistically significant difference in MT Global between the three playing levels [ $F(2, 294) = 3.625, p < .05$ ]. The effect size, calculated using eta squared, was small at 0.2 (Cohen, 1988). A post hoc comparison using the Turkey HSD test indicated that mean score of the elite league ( $M = 2.85, SD = .35$ ) was greater than that of the third league ( $M = 2.72, SD = .37$ ). First league mean ( $M = 2.73, SD = .37$ ) did not differ significantly from either the elite or the third league.

The MANOVA found a significant main effect of mental toughness between the three achievement groups [ $F(3, 291) = 2.46, p < .05$ ; Wilks’ Lambda  $< .05$ ; partial eta squared = .03] and significant univariate effects for both subscales (Table 2). Elite league players had a significantly higher mean MT Confidence score than the third league players. On the MT Control subscale, the mean score for the elite league players was significantly higher than the mean for the second league players.

## Discussion

Among high-performance coaches and athletes, mental toughness is held to be an important determinant of athletic success, and there is some evidence of a relationship between achievement level and mental toughness. Despite

**Table 2.** *Multivariate Analysis of Variance for Mental Toughness by Achievement level*

Dependent variable	df	dferror	F	Playing level	Mean	95% Confidence interval	
						Lower Bound	Upper Bound
MT Confidence	2	293	3.98	Elite league	2.81 <sup>a</sup>	2.73	2.90
				Second league	2.77	2.67	2.86
				Third league	2.66 <sup>a</sup>	2.58	2.73
MT Control	2	293	3.58	Elite league	2.47 <sup>b</sup>	2.34	2.61
				Second league	2.20 <sup>b</sup>	2.05	2.35
				Third league	2.33	2.20	2.45

Note: <sup>a-b</sup> equal letter indicates significant difference  $p < .05$  (Bonferroni post hoc test).

this, the literature review revealed that the mental toughness of female athletes in relation to achievement level had not been intensively studied. Therefore, the aim of this study was to remedy this absence of research.

Due to an unacceptable Cronbach alpha (.57), the MT Constancy subscale was not included in subsequent analyses. This low level of internal consistency has been identified in previous studies that have used the SMTQ since its initial development and psychometric evaluation (e.g. Cowden, Meyer-Weitz & Asante, 2016; Crust & Swann, 2011) and our study adds support to the suggestion that the SMTQ requires further revision for it to be suitable for use in future mental toughness research.

As the MT Global mean for the sample (2.85) was above the subscale arithmetic mean of 2.5, the players perceived themselves to be relatively mentally tough, although the mean was lower than that found in 185 male and 166 female competitive tennis players (3.05 calculated from Cowden et al., 2016) and 110 male university students (2.95, Crust & Swann, 2011). The comparatively lower MT Global in our sample may be due to the other studies including all or over half-male participants, as Nicholls et al., (2009) identified males to possess greater mental toughness compared to females in their comparative study of 454 male and 223 female athletes. Significant differences in MT Global were found between the groups of players in the different leagues. The elite players had a significantly higher

mean MT Global than the third league players, but they did not differ significantly from the second league players, and there was no difference between second and third league players (Table 2). This finding is partially consistent with previous studies indicating that the psychological characteristics of top athletes are different than those of other athletes (Gould et al., 2002; Pashabadi et al., 2011; Vealey & Chase, 2008; Williams & Krane, 2001), especially with respect to mental toughness (Connaughton & Hanton, 2009; Golby & Sheard, 2004; Gucciardi & Gordon, 2011; Mohammadzadeh, Boostani & Boostani, 2009; Shin & Lee, 1994).

Although again lower than means found in male only (mean 2.87, Crust & Swann, 2011) or male dominated (mean 3.02, Cowden et al., 2016) studies, mean MT Confidence was again above the subscale arithmetic mean suggesting that the players perceived themselves to be relatively high in MT-Confidence (Table 1). The MT Confidence mean for the elite league players was also significantly higher than the mean for the third league players (Table 2). In sports, confidence has generally been seen as an important characteristic of elite athletes (Andrew, Grobbelaar, & Potgieter, 2007; Hodge & McKenzie, 2002; Vealey & Chase, 2008). Moreover, in the literature on mental toughness, confidence and self-belief have been highlighted as core attributes (Bull, Shambrook, James, & Brooks, 2005; Gucciardi & Gordon, 2009; Jones et al., 2002; Nesti, 2010; Weinberg

et al., 2012). The scores on the MT Confidence subscale indicate that the athletes believe strongly in their ability to reach their goals. Previous research indicates that elite athletes have a self-regulatory capacity to stay positive and engaged when facing challenging and pressured situations, and they have the confidence to deal with setbacks (Clough & Strycharczyk, 2012; Sheard, 2013). In addition, it is reasonable to include interpersonal assertiveness in MT Confidence (Clough & Strycharczyk, 2012). Interpersonal confidence indicates that athletes can promote themselves in a group and handle difficult or awkward teammates or relationships. Such an attitude is important, especially for elite team sports, in which athletes must 'survive' on a daily basis and handle rivalries (e.g., fighting for playing positions and playing time) in a healthy and constructive manner. Many players in the formative stages of their careers face a number of environmental challenges. The players in Thelwell et al. (2005) frequently mentioned challenges such as selection (e.g., being dropped, not considered for selection, or selected when not expecting it), lacking parent/school support, and transfer to another team, club, or league. In summary, although physical, tactical, and technical abilities are basic requirements for playing at an elite level, athletes also need a confident attitude (a high level of MT Confidence) to manage the challenges and develop into a competitive and authoritative presence on the team and against opponents.

Mean MT Control for the sample (2.34, Table 1) was below the subscale arithmetic mean of 2.5 and again lower than reported in Crust & Swann (2011; 2.74) and Cowden et al. (2016; 2.59 calculated) male and predominantly male samples respectively, identifying that they perceived themselves as relatively low in MT Control. Although the arithmetic subscale mean was not exceeded even in the elite league players, the elite level players had significantly higher mean MT Control than the second league players although but not the third league players, which was unexpected. First, MT Control reflects not only an athlete's perception that she can

control the performance environment (having the opportunity to play and to play well), but also that she can control her emotions. Accordingly, players with high MT-Control scores can interpret and regulate their emotions more effectively (e.g., self-doubts, frustrations, arousal, anxiety). Perceived control may reduce athletes' fear of failure and allow them to realize their full potential. Keeping emotions under control and remaining calm and relaxed under pressure, in addition to having psychological control with respect to unexpected or uncontrollable events, increases an athlete's ability to cope with the situation and perform well. According to Clough and Strycharczyk (2012), individuals with a strong sense of control have unshakable faith that they can control their own destinies and a tendency to feel and act as if they are influential. In elite soccer, winning the game is the ultimate objective for the players, coaches, supporters, managers, and administration, and the pressures and demands are high. A player's current performance is considered in the negotiations for his/her upcoming contract and future monetary benefits. These professional demands may reduce an athlete's perceived influence and control over their team administration. Thus, MT- Control probably significantly enhances a player's ability to handle such professional demands. The unexpected finding regarding MT Control (that the third league players' scores were similar to those of elite level players) may have several plausible explanations. To a certain extent, it may be that MT Control is context specific. The levels of expectation, pressure, and challenges are somewhat lower for third league players relative to elite and second league players. Because there is less pressure on them, third league players may feel that they have influence and control, which is reflected in their MT Control scores. For example, their obligations and club demands are more informal and probably not strongly regulated. Thus, their bonds and obligations to the club, and to soccer in general, may be more recreational and interest driven than they are for elite players. Even if such emotional and personal bonding is strong, the third

league players are self-motivated and therefore perceive a higher degree of control, which impacts their estimations of MT Control.

### Limitations

Whilst this study enhances our knowledge and understanding of mental toughness among elite and sub-elite female soccer players, there are some limitations that should be noted. First, we used a cross-sectional research design, so the findings do not suggest that mental toughness causes elite level playing or vice versa. Second, the unacceptable internal consistency of the MT Constancy subscale meant we were unable to explore this purported mental toughness sub-factor. Further research using longitudinal designs should investigate the development of mental toughness over a sporting career using a more psychometrically robust revised instrument.

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