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ORIGINAL ARTICLE

## The relationship between mental toughness and dispositional flow

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### Abstract

This article tested the relationship between mental toughness (MT) and dispositional flow. A sample of 135 athletes ( $M$  age = 20.81 years,  $SD = 2.76$ ), derived from University sports teams and local sports clubs, gave informed consent before completing questionnaires to assess MT and dispositional flow. Pearson correlations revealed a significant and positive relationship between total MT and global flow scores ( $r = 0.65$ ,  $p < 0.001$ ). Correlations between total MT and dispositional flow subscales were all found to be significant and positive, ranging from 0.26 to 0.68. Correlations between global flow and MT subscales were also all significant and positive, ranging between 0.43 and 0.65. Linear regression analyses found MT subscales to account for 45% of the variance in disposition flow, and flow subscales to account for 50% of the variance in MT. These results suggest a reciprocal relationship between MT and flow.

**Keywords:** *Autotelic personality, commitment, challenge*

### Introduction

The last decade has seen increased interest in understanding human flourishing with a focus on what makes everyday life more fulfilling and enjoyable. The foundations of this new positive psychology movement were laid out by Seligman and Csikszentmihalyi (2000), who outlined that good mental health is characterised by more than simply the absence of illness. At the individual level, Seligman and Csikszentmihalyi suggested that a richer, more fulfilling and satisfying existence is related to positive traits such as courage and perseverance. Furthermore, optimistic thinking concerning the future, high levels of engagement and facing up to challenges in the present, and satisfaction with the past are indicative of progressive achievements and personal growth. One positive psychological construct found to be correlated with perseverance (Clough, Earle, & Sewell, 2002), optimism (Nicholls, Polman, Levy, & Backhouse, 2008) and achievement (cf. Sheard, 2010) is mental toughness (MT).

There appears to be general consensus amongst athletes, coaches and sport psychologists concern-

ing the importance of MT in sport and the potential relationship with performance and success (Crust, 2008; Gucciardi, Gordon, & Dimmock, 2009; Jones, Hanton, & Connaughton, 2007). Clough et al. (2002, p. 38) reported that mentally tough athletes are highly competitive and possess, 'a high level of self-belief and an unshakeable faith that they can control their own destiny, these individuals can remain relatively unaffected by competition and adversity'. These researchers proposed the 4C's model of MT that is represented by: 1. control, which concerns a tendency to feel and act as if one is influential, 2. commitment, which reflects deep involvement with whatever one is doing, as opposed to alienation, 3. challenge, the extent to which individuals see problems as opportunities for self-development and 4. confidence, reflecting a high sense of self-belief and an unshakeable faith in having the ability to achieve success.

To date, much research concerning MT has been qualitative. The key attributes that appear to characterise MT include coping effectively with pressure and adversity, recovering or rebounding from setbacks and failures, persevering, being insensitive or

resilient, having unshakeable self-belief in controlling one's own destiny, thriving on pressure and possession of superior concentration and other mental skills (Crust, 2008; Sheard, 2010). While qualitative studies have led to a better understanding of what MT is, many of the reported associated variables have not yet been corroborated through the use of quantitative methods. Nicholls, Polman, Levy, and Backhouse (2009) suggested that little is known about potential variables that may be related to MT.

One of the central themes of positive psychology is engagement (Seligman & Csikszentmihalyi, 2000), which refers to being absorbed or immersed in what one is doing. High levels of engagement can result in what has been termed 'flow'. Flow is used to describe an intrinsically motivating experience and altered state of awareness which typically occurs when high levels of skill are perceived to be matched with high levels of challenge. Flow reflects when everything comes together for the performer, and is characterised by feelings of effortlessness and absorption in a task. Flow tends to be a very positive experience and is often associated with high levels of performance (Jackson & Eklund, 2002), however such experiences tend to be difficult to predict and transient in nature.

Csikszentmihalyi (1990) initially identified nine dimensions of flow which have subsequently been supported through research in the sport domain (Jackson & Eklund, 2002). These nine dimensions are: 1. balance between challenges and skills; 2. merging of action and awareness; 3. clear goals; 4. unambiguous feedback; 5. total concentration on the task at hand; 6. sense of control; 7. loss of self-consciousness; 8. transcendence of time; and 9. autotelic experience. Furthermore, two instruments with adequate psychometric properties are available to measure the nine dimensions of flow. Jackson and Eklund (2002) modified previously existing questionnaires to produce the Flow State Scale-2 (FSS-2) and the Dispositional Flow Scale-2 (DFS-2). Support was found for a 9-factor model as well as a higher order model (global flow). While the FSS-2 measures flow in a particular event (one particular occasion), the DFS-2 measures the general frequency of flow experiences.

Csikszentmihalyi and Csikszentmihalyi (1988) proposed that certain types of people are more likely to experience flow than are others. The term 'autotelic personality' has been used to refer to the propensity to experience flow, but as Jackson and Eklund (2002) highlight, there is no clear understanding of what the autotelic personality actually is. More recently, Jackson and Kimiecik (2008) proposed the autotelic personality reflects a person who does things for their own sake (intrinsically motivated) rather than for external goals. Despite this

lack of clarity, Jackson and Kimiecik reviewed evidence for several factors such as desire for challenge, superior concentrations skills, high perceived ability, low competitive trait anxiety and intrinsic motivation, which may be associated with frequency of flow experiences. These same factors have also been reported to characterise the mentally tough athlete (Crust, 2008; Sheard, 2010) and both MT and flow have been found to relate to high levels of performance. Jackson and Kimiecik (2008) highlight the need for further research to provide a clearer understanding of the relationships between personality traits (such as MT) and flow.

Theoretically, there are a number of reasons to predict relations between MT and the frequency of flow experiences. First, one of the cornerstones of MT is confidence, which has previously been found related to experiences of flow (Hodge, Lonsdale, & Jackson, 2009). Since confidence represents the conceptual opposite of self-doubt, it is possible that positive thoughts replace unhelpful cognitions and facilitate concentration on the task at hand (see Vealey & Chase, 2008), prompting more frequent experiences of flow.

Second, since mentally tough athletes are characteristically competitive, it is possible, in line with theories of achievement motivation (e.g. Atkinson, 1974) that these athletes seek out or approach a greater number of situations where challenge and skills are likely in balance. In particular, Atkinson theorised that where choice was available, competitive individuals seek out situations where the chances of success are around 50%. In contrast, less competitive (and lower achievers) tend to seek out either very difficult (i.e. where there is no shame in failure) or very easy tasks (i.e. that avoid failure) where challenge and skills are unlikely to be matched.

More recently, Hodge et al. (2009) reported moderate to strong correlations between athlete engagement and dispositional flow. Athlete engagement, characterised by confidence, dedication, enthusiasm and vigour, appears to share some conceptual ground with MT. In short, given that athletes who are high (as opposed to low) in MT are more confident, committed and are more likely to be engaged with a challenging activity, it is hypothesised that moderate to strong positive relations will exist between MT and frequency of flow experiences in athletes' main sports.

## Method

### *Participants*

Participants were 135 club and University athletes ( $M$  age = 20.81 years,  $SD$  = 2.76). All participants had at least one year of experience in their chosen

sport ( $M$  experience = 9.34 years,  $SD$  = 5.43). The sample consisted of 104 male and 31 female athletes who were mostly team sport players (i.e. soccer, rugby union, netball, field hockey etc.) and represented 12 sports.

### Instruments

Participants were provided with a booklet that included a questionnaire concerning demographic information, and two psychometric questionnaires. The Mental Toughness Questionnaire 48 (MTQ48; Clough et al., 2002) was used to measure MT. This 48-item inventory is a trait measure and requires responses to statements on a 5-point Likert scale, ranging from (1) strongly disagree, to (5) strongly agree. Example items include 'I don't usually give up under pressure', and 'I can usually adapt myself to challenges that come my way'. Support for the validity, reliability and factor structure of the MTQ48 has previously been reported (cf. Clough et al., 2002; Horsburgh, Schermer, Veselka, & Vernon, 2009).

The DFS-2 (Jackson & Eklund, 2002) was used to measure dispositional flow. This measure was chosen in preference to the FSS-2 because the aim of the present research was to evaluate the general frequency of flow experiences when partaking in one's main sport, rather than experiences at a single match or competition (which are subject to numerous contextual influences). The 36-items of the DFS-2 measure the nine dimensions of flow previously reported, with 4-items measuring each of the nine dimensions. Respondents report the frequency of their flow experiences using a 5-point Likert scale, ranging from (1) never, to (5) always. Sample items include 'I am completely focused on the task at hand', and 'I have a feeling of total control'. In this study, partici-

pants were asked to complete questionnaires in relation to their main sport (as some participated in more than one sport). Confirmatory factor analyses have provided good support for the nine dimensions of flow, and global flow, with alpha coefficients between 0.78 and 0.90 (Jackson & Eklund, 2002).

### Procedure

Following approval by a University Research Ethics Committee, the second author contacted organisers of sports teams to gain permission to distribute questionnaires. All participants were given briefing sheets, detailing why they had been asked to take part, and each provided written consent prior to completing the questionnaires. In total, 210 questionnaires were distributed, and 135 completed questionnaires were returned, making the response rate 64%. Questionnaires were completed in a variety of locations but most were completed following training sessions.

### Data analysis

Data were visually screened for outliers and checked for normality. Following this, the internal consistency of the MTQ48 and DFS-2 was calculated and compared to previously published data. Descriptive statistics were also calculated on all study variables. Pearson correlations were used to test for relationships between MT and dispositional flow. Correlations between experience, and both MT and Flow were also computed. Linear regression analyses were used to determine which, if any of the MT subscales, predicted the frequency of flow experiences, and which of the flow subscales predicted MT. Finally, a series of independent  $t$ -tests were used to test for gender differences among test variables. Bonferroni

Table I. Descriptive statistics for mental toughness and dispositional flow ( $N$  = 135)

	$M$	$s$
Mental toughness	171.76	20.21
Challenge	29.53	4.02
Commitment	40.63	5.79
Control	47.08	5.68
Confidence	54.52	7.86
Global flow	136.61	17.07
Challenge-skill balance	15.29	2.24
Merging of action and awareness	14.89	2.43
Clear goals	16.06	2.60
Unambiguous feedback	15.92	2.56
Total concentration	15.04	2.64
Sense of control	15.47	2.59
Loss of self-consciousness	13.36	3.55
Transformation of time	16.82	2.42
Autotelic experience	16.82	2.42

corrections were used to adjust  $p$  values because of multiple comparisons.

## Results

Descriptive data from responses to the MTQ48 and the DFS-2 can be viewed in Table I. The alpha coefficients of the questionnaires, and the Pearson correlations between MT and dispositional flow, can be viewed in Table II. The overall internal consistency of the MTQ48 and the DFS-2 was found to be good (0.91 and 0.93, respectively). All subscales, with the exception of the MTQ48 subscale of control (0.63) were found to have at least adequate internal consistency. A significant positive correlation was found between total MT and global flow ( $r=0.65$ ,  $p<0.001$ ). Correlations between the subscales of the MTQ48 and the DFS-2 were all found to be significant ( $p<0.01$ ) and ranged between  $r=0.26$  and  $r=0.68$ . No significant relations were found between experience and MT, or experience and flow. A linear regression analysis (enter method) was performed to further test the relationship between MT and flow. Global flow was used as the dependent variable and the four subscales of the MTQ48 were entered as predictors. Confidence was found to be the strongest predictor of flow ( $\beta = 0.44$ ,  $p<0.001$ ), although both commitment ( $\beta = 0.20$ ,  $p<0.05$ ) and challenge ( $\beta = 0.19$ ,  $p<0.05$ ) were also found to be significant predictors. In total, the MTQ48 subscales accounted for 45% of the variance in global flow. A second regression analysis using total MT as the dependant variable and the nine flow subscales as predictors was also conducted. The flow subscales were found to account for 50% of the variance in MT, with challenge-skills balance ( $\beta = 0.31$ ,

$p<0.01$ ) and sense of control ( $\beta = 0.28$ ,  $p<0.01$ ) found to be significant predictors. No differences were found between men and women in frequency of flow experiences. Finally, in terms of MT, the only significant difference related to gender was that men reported higher levels of control than women ( $t=2.67$ ,  $p<0.05$ ,  $d=0.53$ ).

## Discussion

The results of this study support the hypothesised relationship between MT and dispositional flow. The significant and positive correlations found between global measures of MT and dispositional flow indicates strong relations. Moderate to strong correlations were found between the dimensions of MT and dispositional flow. The largest correlations were found between the MT dimension of confidence, and the flow dimensions of sense of control ( $r=0.68$ ), and challenge-skill balance ( $r=0.66$ ). Linear regression analysis also highlighted the importance of confidence, which was the most significant predictor of global flow. This is also consistent with previous research which found significant and positive relations between confidence and global flow (Hodge et al., 2009). Challenge and commitment were found to be significant predictors of global flow but accounted for much less variance. Given that a balance between perceived high ability and highly challenging situations has been posited as a facilitator of flow (see Jackson & Kimiecik, 2008), it is consistent that high levels of confidence, and challenge were related to the frequency of flow experiences. These findings further support the conceptualisation of MT as a psychological variable

Table II. Pearson product moment correlations between mental toughness and dispositional flow

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Mental toughness	(0.91)														
2. Challenge	0.82	(0.70)													
3. Commitment	0.85	0.63	(0.77)												
4. Control	0.84	0.62	0.60	(0.63)											
5. Confidence	0.92	0.70	0.70	0.66	(0.81)										
6. Global flow	0.65	0.56	0.57	0.43	0.65	(0.93)									
7. Challenge-skill balance	0.66	0.60	0.53	0.47	0.66	0.82	(0.75)								
8. Merging of action and awareness	0.52	0.47	0.40	0.34	0.55	0.76	0.70	(0.79)							
9. Clear goals	0.50	0.39	0.48	0.30	0.52	0.77	0.60	0.58	(0.79)						
10. Unambiguous feedback	0.39	0.33	0.32	0.26**	0.40	0.63	0.46	0.36	0.49	(0.82)					
11. Total concentration	0.55	0.46	0.57	0.32	0.52	0.75	0.55	0.48	0.61	0.41	(0.80)				
12. Sense of control	0.69	0.54	0.58	0.47	0.68	0.85	0.72	0.63	0.63	0.48	0.66	(0.78)			
13. Loss of self-consciousness	0.44	0.34	0.36	0.35	0.43	0.61	0.47	0.43	0.28	0.32	0.32	0.47	(0.82)		
14. Transformation of time	0.46	0.44	0.46	0.28	0.40	0.68	0.55	0.48	0.57	0.26**	0.50	0.57	0.20*	(0.81)	
15. Autotelic experience	0.46	0.44	0.46	0.28	0.40	0.68	0.55	0.48	0.57	0.26**	0.50	0.57	0.20*	0.99	(0.81)

Note: All remaining correlations were significant at  $p<0.001$ . Cronbach's alpha shown in parentheses.

\* $p<0.05$ ; \*\* $p<0.01$ .

related to positive outcomes (cf. Jones et al., 2007; Sheard, 2010).

Consistent with the reasoning of Hodge et al. (2009), it is likely that positive thoughts and feelings about sport experiences are crucial to understanding the links between MT and flow. In particular, given that athletes high in MT are confident in their own abilities (as opposed to self-doubting) it is possible that the reported relations reflect a freeing-up of attention to enable total concentration on the task at hand (see Vealey & Chase, 2008). Whilst this explanation is somewhat speculative, it is difficult to conceive of a self-doubting athlete experiencing many of the commonly reported dimensions of flow, such as a sense of control, perceiving individual skills to equal the existing challenge, having total concentration on the task at hand and loss of self-consciousness. In contrast, mentally tough athletes who are not anxious or threatened are unlikely to be burdened by negative thoughts and feelings, and are free to focus on the task at hand. Given numerous precipitating events can influence cognitive processes (e.g. self-doubt can be overcome following early success in a game and commitment can change over time), this does not preclude athletes low in MT from experiencing flow, but it does appear to make this a less frequent occurrence. While athletes with high levels of MT are more likely to experience flow, this does not guarantee that flow will occur given its unpredictable and transient nature.

It is also possible that athletes high in MT are more likely to seek out or approach achievement situations where a challenge-skill balance is likely. For example, previous theories of achievement motivation posit that high achievers (competitive individuals) seek out situations where there is a 50% chance of success (Atkinson, 1974). As such, it is possible that more frequent experiences of flow represent the competitive, challenge seeking nature of mentally tough athletes who might, more often than their less tough counterparts actively seek out challenging situations, where flow appears more likely to occur. Evidence that offers interesting parallels to this reasoning is reported by Crust and Keegan (2010) who found MT and in particular challenge related to attitudes to risk-taking. Finally, given the reciprocal nature of the reported relationship between MT and flow it is likely that experiencing flow can also impact on MT, perhaps through enjoyment and sense of control promoting both intrinsic motivation and confidence.

One aim of this research was to further understand the relations between personality and dispositional flow, as few previous studies have been directed towards this important task. The present findings, alongside previous work (Hodge et al., 2009; Jackson & Kimiecik, 2008), suggest athletes

who are engaged, committed, confident and able to perceive challenges as opportunities rather than threats, are more likely to experience flow. However, it should be noted that these results do not indicate causation, or the exact nature of any relationship. For example, present linear regression results suggest a reciprocal relationship exists with MT found to predict the frequency of flow experiences, but also flow subscales found to predict MT with a similar amount of explained variance in each case. Conceptually, MT appears to closely resemble what some have termed the autotelic personality, and these findings support the expected relationship with experiences of flow.

Given that flow is posited as a highly enjoyable experience and is related to optimal performance, one of the most important tasks for psychologists is to understand factors (i.e. contextual, dispositional etc.) that facilitate or disrupt flow. Increasing the frequency of flow experiences is a desirable aim for practitioners both inside and outside of sport. One common theme that potentially connects MT and flow is the use of psychological skills and strategies. Crust and Azadi (2010) found significant and positive correlations between MT and the use of relaxation strategies, self-talk and emotional control in both practice and competition. Similarly Jackson, Thomas, Marsh, and Smethurst (2001) found significant and positive relations between flow and use of strategies including thought control, emotional control and relaxation. Furthermore, Gucciardi et al. (2009) have shown that MT can be strengthened via multimodal interventions. This being the case, future researchers might be encouraged to examine if MT interventions also increase the frequency of reported flow experiences. Present findings would suggest that interventions targeted at increasing confidence would most likely impact on flow experiences.

With regard to gender, no significant differences were found in relation to frequency of flow experiences. Only one significant difference was found between men and women in relation to MT (i.e. control). With a much larger sample, Nicholls et al. (2009) found significant gender differences in reported total MT and MT subscales. In the present research an uneven sample distribution (23% female) may have impacted the results.

One limitation of the present research is the use of self-report measures which are susceptible to socially desirable responding. It should also be noted that the present findings relate to club and university athletes, not elite or recreational athletes. Given evidence that both MT (cf. Crust, 2008) and frequency of flow experiences (cf. Jackson & Kimiecik, 2008) may be related to level of performance, the present findings should not be extrapolated to other popula-

tions. Future researchers may wish to further examine the influence of performance level on the relationship between MT and flow. Furthermore, given that flow is likely to be influenced by situational, as well as personality factors, future research should be directed towards understanding the interactions between such variables.

## References

- Atkinson, J. (1974). The mainstream of achievement-oriented activity. In J. Atkinson, & J. Raynor (Eds.), *Motivation and achievement* (pp. 13–41). New York: Halstead.
- Clough, P. J., Earle, K., & Sewell, D. (2002). Mental toughness: The concept and its measurement. In I. Cockerill (Ed.), *Solutions in sport psychology* (pp. 32–43). London: Thomson.
- Crust, L. (2008). A review and conceptual re-examination of mental toughness: Implications for future researchers. *Personality and Individual Differences*, 45, 576–583.
- Crust, L., & Azadi, K. (2010). Mental toughness and athletes' use of psychological strategies. *European Journal of Sport Science*, 10, 43–51.
- Crust, L., & Keegan, R. (2010). Mental toughness and attitudes to risk-taking. *Personality and Individual Differences*, 49, 164–168.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper & Row.
- Csikszentmihalyi, M., & Csikszentmihalyi, I. (Eds.). (1988). *Optimal experience: Psychological studies of flow in consciousness*. Cambridge: Cambridge University Press.
- Gucciardi, D., Gordon, S., & Dimmock, J. (2009). Evaluation of a mental toughness training programme for youth-aged Australian footballer:1. A quantitative analysis. *Journal of Applied Sport Psychology*, 21, 307–323.
- Hodge, K., Lonsdale, C., & Jackson, S. (2009). Athlete engagement in elite sport: An exploratory investigation of antecedents and consequence. *The Sport Psychologist*, 23, 186–202.
- Horsburgh, V., Schermer, J., Veselka, L., & Vernon, P. (2009). A behavioural genetic study of mental toughness and personality. *Personality and Individual Differences*, 46, 100–105.
- Jackson, S., & Eklund, R. (2002). Assessing flow in physical activity: The Flow State Scale-2 and Dispositional Flow Scale-2. *Journal of Sport and Exercise Psychology*, 24, 133–150.
- Jackson, S., & Kimiecik, J. (2008). The flow perspective of optimal experience in sport and physical activity. In T. Horn (Ed.), *Advances in sport psychology* (3rd ed., pp. 377–400). Champaign, IL: Human Kinetics.
- Jackson, S., Thomas, P., Marsh, H., & Smethurst, C. (2001). Relationships between flow, self-concept, psychological skills, and performance. *Journal of Applied Sport Psychology*, 13, 129–153.
- Jones, G., Hanton, S., & Connaughton, D. (2007). A framework of mental toughness in the world's best performers. *The Sport Psychologist*, 21, 243–264.
- Nicholls, A. R., Polman, R. C., Levy, A. R., & Backhouse, S. H. (2008). Mental toughness, optimism, and coping among athletes. *Personality and Individual Differences*, 44, 1182–1192.
- Nicholls, A. R., Polman, R. C., Levy, A. R., & Backhouse, S. H. (2009). Mental toughness in sport: Achievement level, gender, age, experience, and sport type differences. *Personality and Individual Differences*, 47, 73–75.
- Seligman, M., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55, 5–14.
- Sheard, M. (2010). *Mental toughness: the mindset behind sporting achievement*. London: Routledge.
- Vealey, R., & Chase, M. (2008). Self-confidence in sport. In T. Horn (Ed.), *Advances in sport psychology* (3rd ed., pp. 65–98). Champaign, IL: Human Kinetics.