

The role of mental toughness in the occurrence of flow and clutch states in sport

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Mental toughness (MT) is a personality construct that enhances performance in sport, while flow and clutch states are psychological states that underlie excellent athletic performance. This study explored whether flow and clutch states differed between higher MT (HMT) and lower MT (LMT) athletes. Sixteen athletes (HMT $n = 8$; LMT $n = 8$) were tracked for five sport performances, and the occurrence of flow and clutch states was explored through event-focused interviews. Data were analysed in the HMT and LMT subgroups in terms of the initiation of both flow and clutch states, and the sustainment of both flow and clutch states. Contrasts were apparent between subgroups, with differences reported in the initiation of flow and clutch states, and the sustainment of clutch states. Findings suggest individual differences in the occurrence of flow and clutch states between HMT and LMT athletes, and extend understanding of MT, flow, and clutch states.

KEY WORDS: Peak performance, Event-focused interviews, Enjoyment, Optimal experience, Positive psychology.

Understanding how athletes experience excellent performance is of interest to athletes, coaches, and practitioners (Swann, Crust, & Vella, 2017). To date, most research on the experience of excellent athletic performance has adopted Csikszentmihalyi's (2002) flow framework (see Swann, Keegan, Piggott, & Crust, 2012 for a systematic review). Flow is an intrinsically rewarding psychological state characterised by perceptions of control, deep concentration, and a distinct feeling that performances occur more effortlessly com-

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pared to normal (Csikszentmihalyi, 2002). The flow experience has been associated with excellent sport performance (e.g., Jackson & Roberts, 1992), and referred to as “the state of optimal functioning” (Kawabata & Mallett, 2016, p. 369). However, findings from recent ‘event-focused’ interview studies (i.e., conducted soon after and in relation to one specific, recent experience) challenged the view that a single psychological state underlies excellent sport performance (e.g., Swann et al., 2017a, 2017b). Indeed, the findings from event-focused interview studies suggested that two distinct psychological states can underlie superior athletic performance: flow and ‘clutch’ states (Swann et al., 2017a, 2017b). Clutch performance is defined as “any performance increment or superior performance that occurs under pressure circumstances” (Otten, 2009, p. 584), and is considered to occur when an athlete is successful in a challenging and important situation, is aware of the situation’s importance, can experience task-related stress, is concerned with the performance outcomes, and thrives through skill rather than good fortune (Hibbs, 2010).

The experience of flow and clutch states shared a number of overlapping characteristics (i.e., absorption; altered perceptions; confidence; enhanced motivation; enjoyment; and perceived control), but each state contained several distinct features (Swann et al., 2017a). Specifically, clutch states were distinguished from flow in terms of: skill automaticity, heightened awareness, and intense effort rather than automatic/effortless experience; complete and deliberate focus instead of effortless attention; and heightened arousal compared to optimal arousal. Furthermore, Swann et al. (2017b) reported that flow and clutch states occurred through unique processes in specific contexts. Flow occurred in contexts that included uncertainty, novelty, and experimentation. The process of flow occurrence was instigated by positive events. These events provided positive feedback, which built confidence and led to the pursuit of increased challenges. This process continued through establishing open goals, which did not refer to objective performance measures. Alternatively, clutch states were experienced in pressured situations, when outcome goals were imminent, and at important moments. The process of clutch occurrence was triggered by a challenge appraisal, which was followed by setting fixed goals, which were specific, measurable, and often outcome-oriented. Subsequently, an increase in intensity and effort facilitated the transition into clutch states (Swann et al., 2017b).

The findings of event-focused interview studies offer a more refined outlook on psychological states underlying excellent sport performance and raise questions about existing knowledge in this area (Swann, Piggott, Vella, & Schweickle, 2018). Understanding of the integrated perspective on flow and clutch states is at an early stage and calls for further research on core features of these phenomena have been advanced (Swann, Crust, & Vella,

2017). To date, research on flow and clutch states has adopted a situational perspective (e.g., Swann et al., 2017b), but it has been suggested that personality constructs underlie episodes of flow (e.g., Kimiecik & Stein 1992) and clutch performance (Otten, 2009). Thus, greater understanding of the integrated perspective on flow and clutch states could be forthcoming by investigating individual differences. By doing so, such novel information could be combined with existing knowledge of flow and clutch states (e.g., Swann et al., 2017b) to extend understanding of the mechanisms underlying each state. In turn, this knowledge base could be used to inform the design of more robust, individually-tailored strategies that help athletes to achieve flow and clutch states more regularly and consistently.

Mental Toughness

Given the importance of MT to success and high performance (e.g., Gucciardi, 2017), this construct could have particular theoretical relevance for investigating individual differences in flow and clutch states. Mental toughness is a personal construct that allows individuals to consistently deliver high performance in spite of challenges and adversity (e.g., Hardy, Bell, & Beattie, 2014). Currently there is debate regarding the stability and dimensionality of MT. Some argue that MT is best conceptualised as a unidimensional, state-like construct, which has properties that endure and vary across situations and time (Gucciardi, Hanton, Gordon, Mallett & Temby, 2015). However, most tend to agree that MT is unlikely to alter rapidly over time (e.g., Hardy et al., 2014) and is multidimensional, with confidence, thriving in challenging situations, and focus among the commonly identified features in qualitative work in sport (e.g., Cook, Crust, Littlewood, Nesti, & Allen-Collinson, 2014; Coulter, Mallett, & Gucciardi, 2010; Gucciardi, Gordon, & Dimmock, 2008). Notably, most of these features are included in the Integrated Model of Flow and Clutch States (Swann et al., 2017b). In turn, this suggests that MT could offer a rich lens through which to explore individual differences in the occurrence of flow and clutch states.

Previous research has explored the relationship between MT and the frequency of flow states in *general* (i.e., dispositional flow) by interviewing athletes with higher MT-dispositional flow and lower MT-dispositional flow (Jackman, Swann, & Crust, 2016). Athletes across the sample reported experiences of flow, but contrasts in confidence, coping mechanisms, concentration, goal orientation, locus of control, optimism, and perfectionism were apparent between subgroups. Subsequently, it was suggested that these fac-

tors could underlie differences in dispositional flow between subgroups and could be particularly relevant for the initiation and sustainment of flow states. While this study offered novel findings, the emergence of the integrated perspective on flow and clutch states through event-focused interview studies (e.g., Swann et al., 2017b) has led to concerns with career-based interviews (i.e., participants interviewed about experiences across their career, which may have occurred years previously) on the basis that this method could have produced imprecise descriptions of flow that potentially merge flow and clutch states (Swann et al., 2018).

Given the limitations of career-based interviews, event-focused interviews appear to offer a more effective approach to distinguish between flow and clutch states and allow exploration of processes underlying the occurrence of these phenomena (Swann et al., 2018). To date, most studies investigating flow and clutch states have interviewed participants after one performance (e.g., Swann et al., 2017a, 2017b). However, by doing so, it is unknown whether the experience reported by participants in these performances is typical or atypical (i.e., one-off occurrence), thus reducing the appropriateness of this method for investigating individual differences. An alternative approach to explore the role of MT in the occurrence of psychological states underlying excellent performance in sport could involve tracking purposefully sampled higher MT (HMT) and lower MT (LMT) athletes across multiple performances and conducting event-focused interviews. In turn, this extension of the event-focused interview approach could provide more comprehensive insights into the experience of each participant and permit comparisons between performances. Thus, by conducting multiple, event-focused interviews with HMT and LMT athletes, this refinement could offer more detailed insights into the association between MT and flow compared to previous work (Jackman et al., 2016), and provide novel insights into the MT-clutch state relationship.

Theoretically, there are several overlaps between MT and clutch states. Firstly, clutch states underlie excellent performance under pressure (Swann et al., 2017a). Since MT facilitates the achievement of goals despite pressure (e.g., Hardy et al., 2014), it is possible that MT could increase proneness to clutch states. Second, as confidence is a characteristic of clutch states (Swann et al., 2017a), this reconciles with a key feature of MT, which is the capacity to maintain confidence in pressured situations (e.g., Coulter et al., 2010; Gucciardi et al., 2008). Finally, focus and concentration are characteristics of MT (e.g., Cook et al., 2014; Jones, Hanton, & Connaughton, 2007) that could enable athletes to reach and sustain the complete and deliberate focus concomitant with clutch states (Swann et al., 2017a).

In addition to theoretical intersections between MT and clutch states, empirical findings on MT and clutch performance highlight the importance of investigating clutch states in HMT and LMT athletes. Previous qualitative research exploring clutch performance reported that elite golfers who frequently excelled under pressure appeared to have higher levels of MT compared to those who choked more regularly (Hill, Hanton, Matthews, & Fleming, 2010). Further, elite golfers reported that approach coping strategies were more effective for managing stressors in pressured situations and facilitated clutch performance (Hill & Hemmings, 2015). This finding is noteworthy given that athletes with higher levels of MT report greater use of approach coping strategies (Nicholls, Polman, Levy, & Backhouse, 2008). Thus, MT could enable athletes to cope more effectively with pressured situations to instigate clutch performance, although further work is required to understand the role of MT in the occurrence of clutch states. In turn, this suggests that investigating the relationship between MT and clutch states could extend theoretical understanding and enable the development of applied recommendations for performance under pressure in sport.

The purpose of this study was to explore the role of MT in the occurrence of flow and clutch states. More specifically, this study aimed to understand whether the occurrence of flow and clutch states differed between athletes with higher and lower levels of MT. To build on recent work (Swann et al., 2017a, 2017b), this study aimed to qualitatively explore the occurrence of flow and clutch states in HMT and LMT athletes across multiple performances. Hence, this study design extended the event-focused interview approach employed in previous research (e.g., Swann et al., 2017a) by investigating the experience of intensity-sampled HMT and LMT athletes across multiple rather than single performances and interviewing participants soon afterwards.

Method

PARTICIPANTS AND SAMPLING

To obtain detailed insights from the perspective of information-rich cases, intensity sampling (Patton, 2015) was employed to sample HMT and LMT participants. To facilitate this process, the participant-selection variant of the explanatory sequential mixed method design (Creswell & Plano Clark, 2011) was used. Initially, the Mental Toughness Questionnaire-48 (MTQ48; Clough, Earle, & Sewell, 2002) was completed by 256 athletes, the findings of which are reported elsewhere (Jackman, Crust, & Swann, 2017a). Although there is debate about the validity of the MTQ48 (e.g., Birch, Crampton, Greenlees, Lowry, & Coffee, 2017; Gucciardi, Hanton, & Mallett, 2012), support for the factorial validity of the MTQ48 was found in a

large-scale evaluation (Perry, Clough, Crust, Earle, & Nicholls, 2013) while the internal consistency in the sample was found to be excellent ($\alpha = .90$). The inclusion criteria for intensity sampling HMT and LMT participants was that an individual's MT score was in the upper (i.e. MTQ48 sten score¹ ≥ 7) and lower (i.e., MTQ48 sten score ≤ 4) range of MT results, respectively. A total of 26 individuals meeting the criteria were randomly selected and invited to take part in the current study, with 16 athletes (M age = 24.9 years, $SD = 3.5$; five men, 11 women; 15 Irish, one British) agreeing to participate (see Table I). Each HMT and LMT subgroup contained eight athletes. Participants will, hereafter, be referred to by a subgroup abbreviation and number.

PROCEDURES

Ethical approval for the study was granted by an ethics committee at a British university. Each participant was allocated an identity code and asked to complete an online questionnaire hosted on Qualtrics (see *Measures and event-sampling*) as soon as possible (time-delay range = 2-24 hours) after each of five competitive performances (i.e., matches, races; M duration between performances = 13.26 days, $SD = 10.75$). After providing consent to take part in the study, each participant provided information on their competitive schedule for the subsequent two months to the first author. To circumvent the potential for missing data points due to changes in this schedule (e.g., schedule changes or injuries) or participant bias (e.g., participants not completing the questionnaires after certain performances), the first author contacted each participant after every performance to confirm the details of their next performance. The decision to collect questionnaire data online was taken to address logistical difficulties associated with gaining access to multiple athletes competing simultaneously in different countries. The process of event-sampling (cf. Reis & Gable, 2000) was used to recruit participants for follow-up interviews (see *Data collection*).

DATA COLLECTION

Data for the current study were collected in two phases, as described below. First, all participants completed a questionnaire, which sought to detect the potential occurrence of flow and/or clutch states. Second, if the questionnaire responses satisfied specific criteria, the participants were invited to take part in a follow-up interview to discuss that performance.

Measures and event-sampling. A section of the Flow Questionnaire (FQ; Csikszentmihalyi & Larson, 1984) and the Flow State Scale-2 (FSS-2; Jackson & Eklund, 2004) were employed to identify the potential occurrence of flow and/or clutch states. The FQ was developed to assess the occurrence of flow, and the FSS-2 is a 36-item inventory designed to assess flow intensity. Although originally designed to measure flow, the contents of each questionnaire were informed by career-based interviews, which have been criticised due to the potential amalgamation of multiple states into descriptions of flow (Swann et al., 2018). Recent

¹ A sten score signifies an individual's approximate position with respect to population norms, ranging on a scale from 1 to 10 (midpoint = 5.5). Scores of 1-4 and 7-10 indicate that individuals are within the lower and upper 23rd percentiles of population norms, respectively.

research identified issues with the discriminant validity of both measures and stated that “the majority of FSS-2 items could represent the experience reported during clutch states” (p. 119) and “the contents of the [FQ] quote employed also represented some elements of the subjective experience described by participants during clutch states” (Jackman, Crust, & Swann, 2017b, p. 122). Therefore, due to the potential confounding of flow and clutch states in the FQ and FSS-2, these measures were employed to identify the potential occurrence of flow and/or clutch states, with the follow-up interviews assessing the specific state(s) experienced, if any (see *Interviews*).

To be sampled for an event-focused interview, participants were required to satisfy at least one of the following criteria: (i) indicate a positive response to a quote from the FQ; or (ii) report a global mean score in excess of four on the FSS-2. In the case of the FQ, participants were first asked to read the following quote: “I am totally involved in what I am doing. My mind isn’t wandering. My body feels good. I am totally focussed but it is not hard to concentrate. I am oblivious to my surroundings. I am performing automatically, without thinking about it. I feel confident.” The next section presented the following question: “During this performance, did you have a similar experience, however brief, at any stage?” to which they could respond “yes” or “no.” In the event of responding “yes”, participants were asked to partake in an interview. A pragmatic approach was adopted when assessing the FSS-2 responses, with those who reported a mean FSS-2 score equalling or exceeding four sampled for interviews. This decision was taken on the basis that the instrument measurement labels of four and five indicate that the participants “agree” or “strongly agree” that the item statements represented their experience (Jackson & Eklund, 2004), thus increasing the likelihood that flow and/or clutch states were experienced. However, the decision on whether or not a flow and/or clutch state had occurred was based on the analysis of data collected through the event-focused interviews (see *Data analysis*). The criteria for event-sampling was satisfied in 46 of the 80 assessed performances (i.e., all 16 participants completed the questionnaire after five performances, totalling 80 performances). Upon satisfying the event-sampling criteria, the first author contacted the participant to request an interview to discuss their experience in that performance. Participants were not asked to take part in an interview if the criteria for event-sampling were not satisfied.

Interviews. To identify the psychological states experienced and explore the processes underlying the occurrence of these states in HMT and LMT athletes, semi-structured interviews ($n = 38^2$; M length = 46.1 minutes, $SD = 11.7$) were conducted by the first author as soon as possible after performances in which the criteria for event-sampling was satisfied ($M = 4.1$ days later; range = same day to nine days later). Most interviews were conducted via Skype ($n = 27$), to minimise the delay between the end of the performance and data collection, and the remaining 11 took place face-to-face. An open-ended, semi-structured approach was adopted by the researcher, which encouraged participants to elaborate and permitted further exploration of key areas discussed (cf. Sparkes & Smith, 2014). Participants were asked to chronologically describe their experience across the performance and to identify periods of elevated performance (e.g., “did you feel that things were going particularly well for you at any point?”). The participants were then asked to describe their psychological state during these

² Eight interviews collected data on two consecutive events, due to scheduling constraints (e.g., athletes performing on consecutive days). To minimise differences with other interviews, the events were discussed chronologically (i.e., the first event was discussed before the second) using the same interview schedule.

periods (e.g., “what were you thinking about and feeling?”) and discuss its initiation, sustainment, and disruption (i.e., if this occurred). Probing questions, such as “can you tell me more about that?” were asked to extract more elaborative details on these experiences. Prior to ending the interview, participants were asked if they wished to add more information on their experience. Interviews were digitally recorded and transcribed verbatim in preparation for data analysis. Brief notes were taken throughout to develop probing questions.

DATA ANALYSIS

A team approach, consisting of all three authors, guided the analysis. Guidelines for thematic analysis (Braun, Clarke, & Weate, 2016) were followed. Initially, the first author, who conducted the interviews, repeatedly read and re-read each transcript to increase familiarity with the data through the process of ‘in-dwelling’ (Maykut & Morehouse, 2002). Next, the first author engaged in a process of systematic coding which sought to identify features in the data describing the occurrence of flow or clutch states. Quotes were sought to produce initial *codes* describing the performance contexts, processes, and experience of flow and clutch states. These codes were sorted and inductively combined to create *categories*. The frequency of flow and clutch states was then determined by summing the number of performances in which each state was reported in the event-focused interviews for each participant (see Table I).

At this point, data were re-examined for deeper patterns of meaning (cf. Braun et al., 2016) in relation to the occurrence of flow and clutch states, with an abductive approach (cf. Timmermans & Tavory, 2012) combining deductive and inductive analyses employed. The first, deductive stage, involved identifying phases in the occurrence of flow and clutch states for each participant in terms of their (i) initiation (i.e., when and how each state was entered), and (ii) sustainment (i.e., maintaining each state and how it was disrupted, if this happened). The second, inductive stage sought to describe unique explanatory features of the initiation and sustainment of these states within each subgroup. Specifically, relevant quotes were sought to generate initial *codes* that described the initiation or sustainment of each state. After a process of review and refinement within the HMT and LMT subgroups, these codes were then organised and inductively combined to form *themes*. An iterative approach was then employed, which involved recursive movements within and between the HMT and LMT subgroups. This enhanced the researcher’s sensitivity to issues that were of relevance in each subgroup, and highlighted similarities and differences (see *Findings*).

Trustworthiness. The term trustworthiness is used by qualitative researchers to describe strategies adopted to enhance the quality of their work (Sparkes & Smith, 2014). *Peer debriefing* was conducted throughout between the first author and co-authors, who offered critical insights throughout the study on the processes of data collection and analysis, and critically evaluated data interpretation (Creswell, 2014). This process took place in formal meetings and through regular discussions between the first author and co-authors individually.

Findings

Flow and clutch states were each reported by all participants (Table I). Descriptions of the performance contexts, process of occurrence, and expe-

TABLE I
 Descriptive information, frequency of flow and clutch states, and descriptions of flow and clutch states for each participant in the study

Participant	Age	Sex	Sport	Competition level	State frequency during assessed performances		Illustrative quote for flow state	Illustrative quote for clutch state
					Flow	Clutch		
HMT1	29	M	Running	N & R	3/5	3/5	I was in good rhythm. My technique was really good. I was completely relaxed. (D)	You are just focusing on getting to the line, giving it everything you have. (B)
HMT2	28	F	Running	L	4/5	4/5	There was no dialogue in my head...you literally just glide...your body moves in perfection. (A)	It's just about expending absolutely everything that I have...I'm thinking only of one thing...I'm thinking 'hit that end line.' (B)
HMT3	26	M	Football	N	2/5	3/5	You nearly don't have to focus on anything...you are in that zone...you are really confident. (A)	My focus switched to getting through this...you know that you need to up it. (E)
HMT4	31	M	Hurling	N & R	2/5	2/5	There were no thoughts... I felt energy in my legs...I was in the moment. (A)	It took effort. It took focus. You nearly had to tell yourself 'the ball.' (E)
HMT5	26	F	Football	N & R	3/5	3/5	It was natural...skills came easily... I didn't worry about the score. (D)	It was pure and utter concentration...it was a conscious decision to push myself. (C)
HMT6	21	F	Camogie	N	1/5	1/5	I was in a state of total confidence. I had more energy...it was more effortless. (B)	I definitely upped my performance...I mentally refocused. (B)
HMT7	31	F	Basketball	R	3/5	3/5	It was a psychological and physical freedom...a mental weightlessness...I was doing things that I hadn't planned. (E)	I became very outcome-oriented and focussed on the score...I stepped it up. (E)

(Continued)

(Continued) - TABLE I

Participant	Age	Sex	Sport	Competition level	State frequency during assessed performances		Illustrative quote for flow state	Illustrative quote for clutch state
					Flow	Clutch		
HMT8	24	F	Basketball	I & N	4/5	2/5	It was natural...skills came easily...I didn't worry about the score. (A)	The game was closer...I knew we had to win...it clicked me into focus. (C)
LMT1	26	M	Football	N	3/5	2/5	There's more expression, more freedom, more natural instinct... your confidence and composure are at an all-time high. (A)	It was more conscious...There was a lot of focus...calculating and processing. (E)
LMT2	24	F	Basketball	N	3/5	1/5	There wasn't any extra stress...there was no mental pressure...I was happy in the way I was playing. (B)	There was so much adrenaline...I was more pumped up...the score was closer. (C)
LMT3	25	F	Camogie	N	1/5	1/5	Everything was going right...It didn't feel as hard as normal to concentrate. (E)	I got myself into the zone...I just felt fully in control and I felt confident. (A)
LMT4	19	F	Football	N	2/5	1/5	I didn't have to concentrate as much...everything works in sync. (E)	Something clicked...I was confident...it was more intense. (A)
LMT5	23	F	Camogie	R	3/5	1/5	My mind was set in the game...I was just playing natural...it wasn't forced. (A)	It was like a light switch...I had total focus on the game. I had total control. (B)
LMT6	24	M	Squash	R	3/5	1/5	It felt so easy and comfortable. It went by quite quickly. It was about reaching that calm zone. (C)	It required quite a bit of effort...I had to be focussed...It was a hard game. (C)
LMT7	19	F	Camogie	N	1/5	1/5	I felt like it was so much easier...it didn't feel hard physically. I felt lighter. (A)	I was just basically working hard...I felt like we were going to win. (A)
LMT8	23	F	Camogie	N & R	4/5	1/5	No nerves, no anxiety and no fear...I felt more confident. (A)	I was concentrating more...I stepped it up. (E)
HMT sample state frequency					22/40	21/40		
LMT sample state frequency					20/40	9/40		

Note: HMT = higher mental toughness; LMT = lower mental toughness; competition level abbreviations are as follows: I = international; L = local; N = national; R = regional.; the points of data collection are represented by alphabetically ordered letters as follows: A = performance 1; B = performance 2; C = performance 3; D = performance 4; E = performance 5.; State frequency during the assessed performances was determined based on the qualitative data analysis.

rience of flow (Table II) and clutch states (Table III) were consistent across subgroups, and similar to previous qualitative studies (e.g., Swann et al., 2017b). Flow states were described in a similar proportion of HMT (22/40) and LMT (20/40) performances. Clutch states were reported in just over half of the performances (21/40) for HMT athletes, compared to under a quarter of LMT performances (9/40). Key findings (Table V) are presented in four sections as follows: (i) initiation of flow states; (ii) sustainment of flow states; (iii) initiation of clutch states; and (iv) sustainment of clutch states. Three sections are presented from the perspective of HMT and LMT subgroups to highlight differences. Themes are italicised in-text, with data extracts used to illustrate. Performances are indicated by alphabetically ordered letters: A = performance 1; B = performance 2; C = performance 3; D = performance 4; E = performance 5.

INITIATION OF FLOW STATES

Similar to a previous event-focused interview study (Swann et al., 2017b), flow states occurred in situations of exploration and lowered perceptions of pressure/expectation, and were reported following the occurrence of: positive events; provision of positive feedback; building of confidence; challenge appraisal; and setting open goals. While the process underlying the occurrence of flow was comparable across subgroups, differences in how participants explained the initiation of this process were identified.

Higher mental toughness athletes. A prominent finding was that flow tended to occur early in the performance for HMT athletes, and often began following their initial engagement in the task. Although the “state of total confidence” experienced during flow was bolstered by positive events, a feeling of *confidence* was discussed before performances, which facilitated an early transition into flow:

I had a lot of confidence going into the game... We went into the warm up and that confidence stayed with me... I caught the first pass in the game and I shot it from a really tight space. It went in and everything flowed from there. (HMT7 D)

Early transitions into flow states were also facilitated by *motivation for the challenge*:

My main aim was to be challenged and to enjoy it... You have that initial excitement and set off at a quick pace and think “this is quick” but then you settle in your rhythm and think “I know I can sustain this pace” ... Things just unfold from there. (HMT2 C)

TABLE II
Categories And Example Codes For The Performance Context, Process Of Occurrence, And Experience Of Flow States In Higher Mental Toughness And Lower Mental Toughness Participants in the study

Category		Example codes	
		HMT participants	LMT participants
Performance context	Exploratory contexts	I hadn't run that distance for a while; I did not know what to expect from the race.	I let the shackles off; I was going in and seeing how did I get on if I did not have specific goals in mind.
	Lower perceptions of pressure/expectation	It was a no pressure situation; I didn't go in with massive expectations and said 'just go out and give it your best'.	There was no real pressure on me or on anyone so I felt that we just had to go out and give it our best shot; I didn't feel under pressure.
Process of occurrence	Positive events	I started well and opened up a lead quite quickly; I put into place two of the goals I set before the game.	I won three or four balls; I won the first few points and started quite well.
	Positive feedback	The pace was fine for me and my legs felt good; feeling completely at ease.	I felt myself that I was doing well; you realise 'I am able for this'.
	Increased confidence	My confidence rose; confidence in your own ability goes through the roof.	You get more confident; I was getting more confident.
	Challenge appraisal	You want to express yourself; your motivation increases.	Set yourself higher standards; willing to take more of a risk.
Experience	Setting open goals	Trying moves that I haven't done in a long time; the goals weren't as clearly defined.	In my head, I was going 'What's the next thing that you can do?'; it was a case of thinking 'how I am in it, let's see what I can do'.
	Absence of critical thoughts	You didn't have to think and you didn't have to process; I don't really start to analyse anything.	I didn't feel as though I was under too much pressure; I was not second-guessing myself.
	Absorption	I was very engaged in the run; you are completely immersed in it.	I am almost in my own bubble; nothing else was coming into my mind.

(Continued)

(Continued) TABLE II

Category	Example codes	
	HMT participants	LMT participants
Altered perceptions	There seemed to be an awful lot more space; I had no awareness of time or of the score.	It is hard to even remember these situations; it went by quite quickly.
Automaticity/ effortlessness	My shots were more free flowing; it just seemed to click.	You just feel like everything works in sync; everything just clicks; it becomes instinctive.
Confidence	I was more confident in my ability; feel stronger and more confident.	I just had more confidence in myself; you gather more confidence.
Effortless attention	There wasn't that much focus required, it just seemed to come naturally.	Concentrating on the now; all you are focussing on is that moment.
Enjoyment	It was a really enjoyable experience; It gives you complete enjoyment.	It's more enjoyable; it was more enjoyable.
Motivation	Feeling very positive, motivated and energetic; you were nearly saying 'give me the next ball.'	More determination; I just felt motivated.
Optimal arousal	Everything was calm; I didn't feel tense.	More relaxed; I got more and more relaxed.
Perceptions of control	More control over my performance; feeling totally in control.	You are ready for what is going to come next; you definitely were in control.

Note: HMT = higher mental toughness; LMT = lower mental toughness.

TABLE III
Categories And Example Codes For The Performance Context, Process Of Occurrence, And Experience Of Clutch States In Higher Mental Toughness And Lower Mental Toughness Participants in the study

Category		HMT participants	LMT participants
Performance context	Perceived pressured context	We were really under pressure; more pressure.	I was under pressure; the scores were close.
Process of occurrence	Challenge appraisal	I placed a demand on myself and said 'you need to take this on now'; You are thinking 'let's push it now. Let's do this'.	I realised that I needed to up my game; I really had to achieve a high level of performance.
	Setting specific goals	I said 'I am going to be relentless until the game stops'; I knew that I had to do specific things.	Focused on winning the match; I could just give it my all for the last 30 minutes.
	Decision to direct attention and effort towards goals	It would have been literally a split-second decision and saying 'go'; I stepped it up.	I was trying harder to get involved and working hard; I had to consciously flick that switch to become more focused on the goals that I had set out to do.
Experience	Absence of worry	There was no stage that I lost that confidence; there was no panic.	I wasn't worried about my marker; no negativity; I didn't panic.
	Absorption	I was still in the zone; I couldn't tell you what was going on around me.	Nothing else was in my mind; it would have been very hard to distract me at that stage.
	Altered perceptions	It was more of a sensation; I couldn't actually tell you what I was thinking.	There is very little time to do anything; your whole body just changes.
	Confidence	I had the confidence at this point; I had more confidence.	I felt we were going to win; you're confident.
	Enjoyment	I really enjoyed it; enjoyed it a lot more.	The good feeling that you get from it lasts; happy in what you have done.
	Heightened arousal	A bit more of a buzz; I probably had more tension in my face.	I think it got you more, again, pumped up; your heart starts beating faster.
	Heightened awareness	I was more conscious of the surroundings; I knew that he was close.	You are hyperaware of everything.
	Intense/ deliberate focus	It was pure and utter concentration; the prime focus was seeing out that game.	Total focus on the game; I was looking solely down the field and concentrating on getting the ball out.
	Intense effort	I was trying to give all I had; it was such an effort.	I was trying so hard; basically, working hard.
	Motivation	I was keener; it just gives me an extra bit of a push.	I was eager; motivated in the match.
	Perceptions of control	Very composed; it was within my control if I put in the effort.	I felt in full control; I had total control over myself.

Note: HMT = higher mental toughness; LMT = lower mental toughness.

Collectively, these themes captured key aspects of the initiation of flow states in HMT athletes.

Lower mental toughness athletes. The transition into flow was a more gradual process for LMT athletes: “For me, in my experiences, it is a slow build up to it. I very rarely start and then within a few points I am there” (LMT6 A). Flow was often preceded by an assessment period, during which *uncertainty* and *cautiousness* were reported. Before experiencing flow, LMT2 (C) reported a conservative performance and a desire for evidence of task competence: “When you start out, you are uncertain...I assessed the situation and how I fitted into the game...You play safe to start and get comfortable.” However, following the occurrence of positive events, this alternated to *increased confidence* and the *pursuit of extended challenges*, which facilitated flow: “When you see that’s [playing safe] working, you’re saying ‘I’ll go for more’. You’re avoiding failure, so you’re beginning to flow, and you’re looking for success...You have that comfort and confidence in what you’re doing” (LMT2 C). Hence, flow occurred through the same process for LMT athletes, but was reported as being more gradual.

SUSTAINMENT OF FLOW STATES

Findings pertaining to the sustainment of flow were consistent across the entire sample and no differences were apparent in this phase between subgroups. During flow, participants reported greater *acceptance* of mistakes compared to normal, which was linked to the reduced emphasis placed on outcome goals: “If you made a mistake we weren’t overly focussed on the mistake...that probably came from the freedom and not having to worry about what the consequences were, what our goals were, or what we wanted to achieve” (HMT7 A). *Being in the moment* facilitated the sustainment of flow: “You are completely engaged in the moment” (HMT2 C). Consistent with the process of flow occurrence, this experience could continue provided that exploratory performance contexts were present and that the process was stimulated by *positive events*: “The encouragement in relation to the lap times allowed me to keep switching off” (HMT1 C). Conversely, a *reduction in positive events* disrupted flow: “It was very hard to stay in it [flow] when the weather and the elements are inhibiting that rhythm and your times” (HMT1 B). *Changes in the performance context*, such as interruptions, performance milestones, and increased perceptions of pressure, were also identified as disruptors: “It was there until half-time. We started talking and I

TABLE IV

Themes And Example Raw-Data Codes For Higher Mental Toughness Participants' Explanations Of The Initiation And Sustainment Of Flow And Clutch States

HMT athletes		LMT athletes	
Example raw-data code	Theme	State phase	Theme
		Initiation of flow	Cautiousness
I felt comfortable and confident at the start of the game.	Confidence		There are more limitations initially.
I knew that it was going to be a good standard and a really tough game so automatically I was more motivated.	Motivation for the challenge		I gained confidence. I started to gradually get into the game more and was willing to do more. I was uncertain in terms of how this would play out.
I didn't focus on any mistakes that I made.	Acceptance	Sustainment of flow	I made a couple of bad passes, but overall I was happy.
It was more of a focus on that moment.	Being in the moment		You just go with it until the whistle blows.
The terrain changed.	Changes in the performance context		When the first half finished, it faded away.
I was very efficient with my possession in terms of scores or assists.	Positive events		I didn't make any mistakes for a really long time.
I touched the ball less and less.	Reduction in positive events		The other team were coming into the game.

Note: HMT = higher mental toughness; LMT = lower mental toughness.

TABLE V
 Themes And Example Raw-Data Codes For Higher Mental Toughness Participants' Explanations Of The Initiation And Sustainment Of Clutch States

HMT athletes		LMT athletes	
Example raw-data code	Theme	State phase	Theme
	Challenge seeking	Initiation of clutch	Compromised focus
Not taking the easier option.	Confidence		Identifying a solution
Confidence levels were high.	Confidence		Negative thoughts
The little bit of self-talk worked and helped me to push through the negativity.	Managing unpleasant emotions		Regulate attention
I had the awareness to be in position to win the breaking ball.	Rapid decision-making		
I got back to the real basics of what I have to do to be successful.	Regulate attention		
Just keep plugging away, step by step.	Resiliency		Uncertainty
Because you have done it before, you have that belief in yourself.	Confidence	Sustainment of clutch	Loss of concentration
It was about trying to get the last bit of good out of myself even though I was tired.	Coping with negative feedback		Negative feedback
When things become effortful, it's literally 'right, get to the next point.'	Short-term goals		Negative thoughts
I was saying to myself 'keep it going, don't give up.'	Self-talk		Positive outlook
			Reduced confidence
			Task-related focus

Note: HMT = higher mental toughness; LMT = lower mental toughness.

came out of the match focus... I came out with a different mind-set...We were under a lot of pressure” (LMT3 E). Together, these themes captured descriptions of the sustainment of flow across the entire sample, with no differences identified between subgroups.

INITIATION OF CLUTCH STATES

Consistent with findings in a previous event-focused interview study (Swann et al., 2017b), clutch states were reported in pressured contexts and occurred following: a challenge appraisal; setting of specific goals; and a decision to direct attention and effort towards goals. While the process for entering clutch states was consistent across the sample, differences in descriptions of the initiation of this process were evident between subgroups, particularly during adversity.

Higher mental toughness athletes. A prominent feature underlying the initiation of clutch states in HMT athletes was a desire to approach and position oneself in challenging situations, as reflected by *challenge seeking* cognition and behaviours: “I was facing a steep incline...That’s where my focus changed to ‘right, just get yourself up the hill as quick as possible’...You’re so focused on pushing yourself to that point” (HMT2 D). This finding was salient in problematic situations, when *rapid decision-making* enabled a quick alternation into clutch states:

The game was close...One of their players was free...I said to myself “I will take responsibility for that player”...The challenge brought my focus to the moment. I took more responsibility on my shoulders because when you take responsibility on, you can’t back away from that. (HMT4 E)

Following setbacks, *resiliency*, *confidence*, and *managing unpleasant emotions* facilitated a more rapid initiation of clutch states: “I had to stay positive and say to myself ‘you are a quality player’...I didn’t experience low confidence at any stage...I was reassuring myself...I could step it up” (HMT7 B). Upon encountering unpleasant or irrelevant thoughts, the ability to effectively *regulate attention* helped athletes to quickly reach the intense and deliberate focus characterising clutch states:

My legs were really tired on that one. You just completely forget about that and just really focus on your breathing. Everything else becomes completely irrelevant. It’s just my breathing gets all of my attention...I was pushing harder than I was for the rest of the race. (HMT2 B)

Together, these themes captured distinct aspects of the initiation of clutch states in HMT athletes.

Lower mental toughness athletes. After encountering pressured contexts, a sub-optimal experience was often reported by LMT athletes, which delayed the initiation of clutch states. This finding was salient when performances were not unfolding desirably and necessitated modifications. In these situations, *uncertainty* was initially reported by some: “When things are going against you, you are forced into that conscious state of trying to process and calculate things... Sometimes I don’t see what the obvious problem is. I won’t make a call unless I am sure of it” (LMT1 E). Before a clutch state, LMT8 (E) reported sub-optimal performance: “In the first 10 minutes of the second-half, I was chasing the game... My reactions were delayed, and I was being reactive rather than proactive.” However, it was explained that *identifying a solution* facilitated a transition into a clutch state: “I decided it was more effective to cover my position... I started getting on the ball rather than aimlessly running... I had clearer objectives so I knew the runs I wanted to make and what impact I wanted to have” (LMT8 E). Following an increase in performance demands, *negative thoughts* and *compromised focus* often characterised the initial experience of LMT performers prior to entering clutch states: “He was playing a lot harder. In the first few points of the second game, it definitely put me off a bit because I was thinking ‘oh no, maybe it was a fluke in the first game’” (LMT6 C). However, after investing considerable effort to *regulate attention*, this performer reported an intense/deliberate focus at the end of this game:

It took me a while to readjust and refocus... It required quite a bit of effort because I was so frustrated with myself that I really had to keep thinking... I managed to refocus and retook the lead... I remember it was a hard game and I had to be focussed the entire time. (LMT6 C)

These themes comprised the initiation of clutch states across the LMT participants.

SUSTAINMENT OF CLUTCH STATES

In pressured situations, the emergence of performance stressors threatened the continuation of clutch states, with HMT and LMT participants reporting disruptions. Participants in both subgroups used strategies to sustain clutch states, but differences in the propensity to sustain clutch states were apparent between subgroups, which were highlighted most ostensibly after setbacks.

Higher mental toughness athletes. Athletes in the HMT subgroup reported more prolonged clutch states and employed several psychological

skills to manage/prolong this state. During clutch states, athletes set *short-term goals* to preserve their intense effort and focus, which helped to sustain clutch states: “I could feel myself getting tired...It was the last minute...I kept saying ‘get through the last minute, keep going’. It was more forced but I was able to perform well” (HMT7 A). *Self-talk* was used to sustain confidence during clutch states: “The self-talk would be along the lines of ‘good job’, reassuring myself that the positive things I had done on offence and defence were having a positive impact” (HMT8 C). This strategy was linked to a deeply-rooted *confidence* drawn from a “bank” of past experiences:

I maintained my target pace, but it took a lot of effort...It came from saying “yeah, I can do this” ...It’s a self-belief that comes from building up years of experience of doing different things...You just put them in the bank and then draw on it. (HMT2 E)

This confidence also helped athletes in *coping with negative feedback*, which facilitated the sustainment of clutch states:

I tried a number of avenues but it was difficult...It wasn’t an option to say that I tried and I will let someone else do it and wait for something to happen...I had trust in my ability and didn’t let myself go into the comfort zone (HMT3 E).

Collectively, these themes captured insights into the sustainment of clutch states in HMT athletes.

Lower mental toughness athletes. A *task-related focus* prolonged clutch states: “I was looking solely down the field and concentrating on getting the ball out” (LMT3 A). Likewise, focusing on positive events facilitated a *positive outlook*, which sustained clutch states: “My mind-frame was positive. I knew I had done some good things, so I focused on them” (LMT2 C). Despite the effective use of such strategies in some cases, clutch states experienced by LMT athletes appeared to be more susceptible to disruption. A notable finding concerned the adverse impact of *negative feedback*, as the athletes described a sudden change in their psychological state, which was characterised by a *loss of concentration* and *negative thoughts*: “I made a mistake...That knocked me out of it. I suddenly snapped out of being fully concentrated...I tried to focus on the match but I had the mistake or two in my head” (LMT3 A). In such instances, some discussed a feeling of *reduced confidence*: “I made a mistake...I had no confidence. I just started questioning every move I made” (LMT5 B). Overall, these themes represented experiences concerning the sustainment of clutch states in LMT athletes.

Discussion

The aim of this study was to explore whether the occurrence of flow and clutch states differed between HMT and LMT athletes. By tracking intensity-sampled HMT and LMT athletes and conducting event-focused interviews, this study explored the occurrence of flow and clutch states from the perspective of athletes with different levels of MT. Findings in the current study broadly support the recently proposed integrated model of flow and clutch states (Swann et al., 2017b) in suggesting that the performance context, particularly perceptions of pressure, and nature of the goal being pursued influence whether individuals experience flow or clutch states. Sampling HMT and LMT participants permitted comparison between subgroups regarding their perceptions of the occurrence of flow and clutch states, and differences were apparent in the initiation of flow, and the initiation and sustainment of clutch states. This study extends understanding about psychological states underlying excellent performance in sport (e.g., Jackman et al., 2016, Swann et al., 2017a, 2017b) by providing novel insights into individual differences and the occurrence of flow and clutch states through multiple event-focused interviews with intensity-sampled HMT and LMT athletes. As such, this study begins to address calls for investigation of core aspects of the integrated perspective on flow and clutch states (Swann, Crust, & Vella 2017) and suggests that individual differences offer another line of inquiry to develop understanding in this area.

A primary contribution of this study was that differences between HMT and LMT subgroups were most striking for clutch states. Given that clutch states occurred in pressured contexts, this reflects the view that MT enables individuals to excel under pressure (e.g., Hardy et al., 2014). In such contexts, HMT athletes reported a desire to approach challenges that arose. In turn, this finding supports past work that found choosing the harder option and appraising demanding situations as challenges as characteristics of MT (Crust, Swann, Allen-Collinson, Breckon, & Weinberg, 2014). Consistent with the theoretical model of challenge and threat states in athletes (Jones, Meijen, McCarthy, & Sheffield, 2009), challenge appraisals were underpinned by confidence. When exposed to negative events during clutch states, HMT athletes drew on a deep-rooted confidence to maintain a challenge appraisal and prolong clutch states. The robust nature of confidence in HMT athletes is consistent with previous MT research (e.g., Bull, Shambrook, James, & Brooks, 2005) and current findings suggest that this type of confidence could help athletes to appraise pressured situations as challenges, thus facilitating the initiation and sustainment of clutch states.

Mental toughness has been previously associated with greater coping effectiveness in stressful situations (Nicholls, Levy, Polman, & Crust, 2011), and differences in the initiation and sustainment of clutch states between HMT and LMT athletes were most conspicuous in stressful situations. When participants encountered problems that threatened goal attainment, the capacity to identify an appropriate solution and make an effective decision to address these problems facilitated clutch states. In problematic circumstances, HMT athletes quickly analysed the situation and developed solutions to circumnavigate problems faced, which enabled a swift transition into clutch states. In similar scenarios, the speed of this process was more variable for LMT athletes, as lengthy periods of time often elapsed before the transition into clutch. These findings are consistent with previous research that found a positive association between MT and logical analysis (Nicholls et al, 2008).

Rebounding from setbacks is a characteristic of MT (e.g., Cook et al., 2014) and differences in the capacity to initiate or sustain clutch states following setbacks were apparent between subgroups. Specifically, LMT athletes often reported compromised focus, rumination, and reduced confidence after negative events during clutch states. In contrast, HMT athletes' clutch states were less susceptible to disruption, which was demonstrated most distinctly by their ability to cope more effectively with negative feedback and avoid dwelling on the past. These findings parallel theoretical research in the directed forgetting paradigm, which found that the capacity to put aside past information and focus on the current task was positively related to MT (Dewhurst, Anderson, Cotter, Crust, & Clough, 2012). Further, HMT athletes used several self-regulatory strategies to control their attention and emotions in these situations, which concurs with previous work that found positive associations between MT and thought control (Nicholls et al., 2008), mindfulness (Jones & Parker, 2018), and self-talk (Crust & Azadi, 2010).

The process underlying the occurrence of flow was similar across the entire sample, but explanations of these processes suggested differences in the initiation of flow states between subgroups. An interesting finding concerned differences in the perceived level of confidence and nature of challenges sought prior to flow. Specifically, HMT athletes described high confidence levels and a desire to approach challenging situations, which accelerated the transition into flow states. In contrast, LMT athletes often reported initial uncertainty and pursued more conservative goals, which delayed flow states. Indeed, LMT athletes outlined that positive events were integral for alleviating uncertainty, building confidence, and pursuing the

extended challenges conducive to flow. In line with the process underlying the occurrence of flow, the findings suggest that contrasts in confidence could contribute to differences in the initiation of flow between HMT and LMT athletes. The heightened confidence in HMT athletes is consistent with previous work that identified this as a defining quality of MT (e.g., Coulter et al., 2010), and it is possible that this enables HMT athletes to commence performances in a stronger position to reach the required confidence for flow, thus enhancing their susceptibility to experience flow at an earlier stage.

Summary

In summary, this study presents insights into the occurrence of flow and clutch states from the perspective of HMT and LMT athletes. By doing so, these findings extend the emerging knowledge base on the Integrated Model of Flow and Clutch States (e.g., Swann et al., 2017b; Swann, Jackman, Schweickle, & Vella, 2019) by providing rich and detailed insights into individual differences in the occurrence of flow and clutch states from a MT perspective. Similar to previous work (Swann et al., 2017b, 2019), this study suggests that flow and clutch states occur through distinct processes and contexts. However, the current study provides novel insights into differences in the initiation and sustainment of flow and clutch states between HMT and LMT athletes. In turn, the findings suggest that the occurrence of flow and clutch states are underpinned by a complex and dynamic psychosocial interaction involving: an individual's personality; the situational context; and the process underlying the occurrence of each state. Going forward, this suggests that it is important for research in this area to consider the interaction between personality variables and the mechanisms underlying the occurrence of flow and clutch states.

Strengths, Limitations, and Future Directions

Strengths of the current study include the collection of event-focused data across multiple performances and the process employed to increase trustworthiness. However, several limitations are noteworthy. First, as participants were not interviewed after all performances (i.e., participants were not interviewed after performances in which they did not meet the event-sampling criteria), this study did not capture all potentially relevant information to the role of MT in the occurrence of flow and clutch states. Second, as the

event-focused interviews were conducted after the completion of questionnaires, participants might have sought to align the interview data with their questionnaire responses. Third, it remains unknown whether the criteria employed for intensity sampling HMT and LMT participants and event-sampling of flow and clutch states was successful. Finally, the research team's interpretation of the data is presented, but others could have coded the data differently and generated alternative conclusions.

The findings suggest that future work should consider the interaction between personal factors and processes underlying the occurrence of flow and clutch states. Future studies could explore athletes' experiences across multiple performances, regardless of whether or not they report flow or clutch states, to provide insights into the occurrence and inhibition of these phenomena. Studies could seek to experimentally induce flow and clutch states by encouraging athletes to adopt the type of goal conducive to each state (e.g., Schweickle, Groves, Vella, & Swann, 2017) and critically test findings regarding the role of MT in both the initiation and sustainment of flow and clutch states.

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