An Inductive Exploration into the Flow Experiences of European Tour Golfers

Christian Swann[1], Lee Crust[1], Richard Keegan[2], David Piggott[3] & Brian Hemmings[4]

[1]*School of Sport and Exercise Science, University of Lincoln, Lincoln, UK*

[2]*Research Institute for Sport and Exercise, University of Canberra, Canberra, Australia*

[3]*Research Centre for Sport Coaching and Physical Education, Leeds Metropolitan University, Leeds, UK*

[4]*School of Sport, Health, and Applied Science, St. Mary's University College, Twickenham, UK*

Correspondence concerning this article should be addressed to Christian Swann, School of Sport and Exercise Science, University of Lincoln, Brayford Pool, Lincoln, LN6 7TS. Email: cswann@lincoln.ac.uk; Telephone: (+44) 1522 886030.

An Inductive Exploration into the Flow Experiences of European Tour Golfers

Abstract

This study explored perceptions regarding the experience of flow (Csikszentmihalyi 1975) in elite golf; a sport which is different to those studied previously due to its self-paced, stop-start nature. In-depth, semi-structured interviews were conducted with 10 European Tour golfers. Whereas the majority of previous studies have deductively coded data into Csikszentmihalyi's dimensions, the data in this study were analysed inductively. Thirteen categories were generated which described the flow experiences of these golfers, and these were compared to the original flow dimensions after analysis. In contrast to previous understanding, these golfers reported being aware that they were in flow as it occurred, and seemingly were able to manage their flow experiences. A category describing altered cognitive and kinaesthetic perceptions was also generated which was not accounted for in the existing flow framework, while the participants also suggested that flow was observable (e.g., through changes in behaviour). Findings are discussed in relation to existing literature, and recommendations made for future research including possible revisions to the flow framework to better describe this experience within golf and other sporting contexts.

Keywords: elite athletes; performance; positive psychology; optimal experience; sport psychology.

Introduction

In sport psychology, flow (Csikszentmihalyi 1975, 2002) is conceptualised as an intrinsically rewarding and often harmonious experience in which attention is fully invested in an activity, leading to complete task immersion and high level functioning. Flow is regarded as being an optimal experience (e.g., Jackson & Kimiecik 2008); that is, a state representing some of the most enjoyable, rewarding, and memorable times a person can have. Individuals experiencing flow frequently report performing at the peak of their ability (Jackson & Roberts 1992), making this state highly desirable for athletes. Indeed, flow is of particular relevance to those participating in elite sport where performing at one's peak could have major implications for success in competition (Nicholls *et al.* 2005). There have also been suggestions that flow has psychological benefits such as increased self-concept (Jackson *et al.* 2001) and wellbeing (Haworth 1993). These are especially important given recent suggestions that high-performance athletes are not protected from mental disorders as previously thought due to their unique work characteristics and the physical and mental strains they endure (Bär & Markser 2013). Therefore experiencing flow has important performance-based and psychological benefits, and understanding these experiences from the athlete's perspective could yield important insights into how it may be experienced more often. In this article, our aim is to explore and analyse elite golfers' perceptions regarding the experience of flow, in the highly-elite and relatively under-researched context of the European Tour.

The Experience of Flow in Sport

Current understanding of flow is derived from Csikszentmihalyi's (2002) conceptualisation of the experience into nine dimensions. Three of these dimensions

are proposed to be conditions through which the experience occurs (Nakamura & Csikszentmihalyi 2002), namely: *challenge-skill balance* (a balance between high perceived skills and demands in the situation); *clear goals* so that one knows exactly what to do during the performance; and *unambiguous feedback* about the progress that is being made. The other six dimensions are suggested to be characteristics which describe what the experience is like (Nakamura & Csikszentmihalyi 2002): *action-awareness merging* (deep involvement leads to automaticity and spontaneity)*; concentration on the task at hand* (complete focusing of attention)*; loss of self-consciousness* (concern for the self disappears and the individual becomes absorbed in the activity); *sense of control* (e.g., over the performance); *time transformation* (i.e., either slowing down or speeding up); and *autotelic experience* (the experience is perceived as enjoyable and intrinsically rewarding[1]).

In sport, a number of studies have sought to understand how athletes experience flow (e.g., Bernier *et al.* 2009; Chavez 2008; Jackson 1992, 1996; Sugiyama & Inomata 2005; Young 2000) with qualitative methods (i.e., semi-structured interviews) predominantly used in an attempt to gain rich descriptions and insights into these athletes' experiences (e.g., Jackson & Kimiecik 2008). With the exception of Chavez (2008), however, all of these studies have used a deductive style of analysis, coding data *into* Csikszentmihalyi's nine flow dimensions. This deductive approach was first used in order to explore if/how Csikszentmihalyi's conceptualisation applied in sport (e.g., Jackson 1992, 1996), and has since become

[1] There appear to be instances of inconsistency regarding the specific number of flow dimensions. For example, clear goals and unambiguous feedback have been presented either separately (e.g., Jackson & Csikszentmihalyi, 1999) or as one dimension (e.g., Nakamura & Csikszentmihalyi, 2002). Furthermore, autotelic experience is referred to as a ninth flow dimension in some instances (e.g., Jackson & Csikszentmihalyi, 1999) but in others, usually outside of sport, it is seen as a description of flow as a whole (e.g., Engeser & Rheinberg, 2008). However, flow is most often conceptualised as these *nine* dimensions, particularly within sport research.

the main approach to analysis of this type of data. Therefore, most understanding of how flow is experienced by athletes is based on this process of deductive analysis into Csikszentmihalyi's flow dimensions (Author 1 *et al.* 2012a).

There are, however, problems with this approach. From a philosophical perspective, an issue with over-reliance on deductive coding is that findings could essentially be "shoe-horned" into the flow dimensions, without allowing for evolution or refinement of the theory, e.g., to be more specific to sport (Author 1 *et al.* 2012a). This practice may prevent the emergence of new ideas and insights driven, for example, by subtle differences in the flow experience between sports or levels of expertise, which have been suggested previously (e.g., Chavez 2008; Jackson 1992, 1996).

This deductive approach also poses practical problems when investigating flow experiences in sport. For example, deductive analysis implicitly assumes that the dimensions guiding the analysis are correct and sufficiently clear to prevent erroneous or incorrect coding (e.g., Hyde 2000). However, researchers have detected to "ambiguity concerning individual characteristics of flow" (Kowal & Fortier 1999, p.365), and overlap is apparent in the definition of certain dimensions. For example, Jackson and Csikszentmihalyi (1999) suggest that "when you feel at one with the movements you are making, you are experiencing…the merging of action and awareness" (p.19); and yet: "when athletes speak of becoming one with the activity, they are also referring to freeing themselves [i.e., loss] of self-consciousness" (p.27). Both definitions refer to being "at one" with the activity meaning that coding themes relating to absorption could be problematic. It is also unclear as to where key constructs (such as optimal arousal and confidence) fit into the nine flow dimensions (Author 1 *et al.* 2012a). For example, confidence has been referred to in three

different dimensions: *challenge-skill balance, clear goals,* and *sense of control* (Jackson & Csikszentmihalyi 1999). As such, data pertaining to these constructs could be difficult to code into the existing framework.

These ambiguities in the existing framework and related definitions could also make it difficult for researchers to deductively code qualitative data into them, and could cause some lower-order and raw data themes to be misplaced. Indeed, there are instances in previous studies where such coding seems questionable, indicative of a shoe-horning approach (see Table 1). For example, perceptions relating to energy, pain, the body and feeling strong have been coded into *autotelic experience,* which is defined as the intrinsically-rewarding aspect of flow, and does not seem appropriate (Author 1 *et al.* 2012a). Other perceptions regarding the athlete's body have also been deductively coded into *sense of control*, *action-awareness merging,* and *unambiguous feedback* (see Table 1). These perceptions are similar to the idea of *body sensations* (Bernier *et al.* 2009; Chavez 2008), which is suggested to involve "a heightened perception of the body in the environment in which the athlete is competing" (Chavez 2008, p.88). Similar to literature on physical embodiment (cf. Spinney, 2006), such perceptions do not appear to fit with Csikszentmihalyi's dimensions and may even be an extra, sport-specific, dimension of flow states.

[Insert Table 1 near here]

An inductive approach may be useful to help avoid/address the practical and philosophical issues in deductive coding described above. Descriptions that are generated inductively, free of the concern to fit them into the existing framework, could *then* be compared to the existing conceptualisation of flow in order to explore if, and how, flow is experienced differently between sporting contexts (Author 1 *et*

al. 2012a). Such an approach could allow new themes to emerge from the data, providing more context-specific understanding of how flow is experienced by certain populations of athlete (i.e., from different sports). In turn, an inductive approach could be useful in developing recommendations (e.g., for experiencing flow) which are more specific to certain populations of athlete, rather than relying on more generic recommendations based on multi-sport samples (e.g., Jackson 1995, 1996).

In support of this argument, Chavez (2008) inductively analysed data from 16 NCAA Division 1 team and individual athletes. A number of categories were similar to Csikszentmihalyi's dimensions (such as *perception of control, self-consciousness goes away,* and *focus and concentration*) but, importantly, categories were also identified which were not immediately accounted for in the existing framework, including *heightened visual perception, relaxed and calm aspects of experience,* and *auditory sensations*. While Chavez did not attempt to use these findings to critique or refine the existing framework, they do suggest that further dimensions may be needed to more fully describe the flow experience within sporting contexts.

It is suggested that flow may differ between sporting contexts (e.g., Chavez, 2008; Kimiecik & Stein 1992), and therefore, isolating a single context of athletes could help researchers make clearer comparisons between settings (Author 1 *et al.* 2012a). Studies qualitatively investigating how athletes experience flow have either combined multi-sport samples (e.g., Chavez 2008; Jackson 1996; Sugiyama & Inomata 2005), or single-sport samples from tennis (Young 2000), figure skating (Jackson 1992) and swimming (Bernier *et al.* 2009). In contrast to these sports, rounds of golf can last up to five or even six hours at the elite level, meaning that there are often long periods of time between each shot. Indeed, only around 0.5% of

time during a tournament round may actually be spent executing golf shots (Smith 2010). These periods between shots could be cognitively demanding and "can lead to over-thinking, distraction, perceptions of inadequacy, overly elevated emotions such as anxiety or fear of failure, and possibly even lead to the activation of ironic processes" (Singer 2002, p.360). Golfers would presumably need to overcome all of these in order to experience flow. Therefore it could be the case that flow states are experienced differently in golf compared to other sports studied previously, warranting investigation.

A number of studies have investigated optimal psychological states within golf. Cohn (1991) explored the characteristics of *peak performance* (but not flow) in golf; while two studies have explored the *factors influencing* (e.g., facilitating, preventing, and disrupting) flow how flow occurs (Catley & Duda 1997; Author 1 *et al.* 2012b). Stein *et al.* (1995) also included golfers in their sample when investigating psychological *antecedents* of flow in recreational athletes. No studies, however, have yet explored what the experience of flow is like in golf. Furthermore, exploring flow at the elite level, where it is arguably of most relevance in terms of performance benefits (Nicholls *et al.* 2005), could provide insights for athletes aiming to reach the highest level. Elite athletes are assumed to have a larger reference base to draw upon when discussing their experiences in sport, and may be more regularly exposed to the challenging situations suggested to be a key condition of flow, enhancing the richness of data obtained (Jackson 1996).

Therefore, this study aimed to explore qualitatively perceptions regarding the experience of flow in elite, full-time European Tour golfers. This will begin to address researchers' calls to explore what flow states are like for athletes in different sports (e.g., Chavez 2008; Jackson 1992, 1996), as well as provide an insight into the

peak states of a highly-elite sample. This study aimed to avoid the deductive approach described above by allowing themes to emerge from the data as inductively as possible. In doing so, we aimed to compare the resulting description of flow to Csikszentmihalyi's dimensions *after* analysis, rather than using it as an *a priori* framework, thus responding to Jackson's (1996) call for research "refining Csikszentmihalyi's model of flow to more specifically describe flow in sport environments" (p.85).

Method

The problem noted in the previous section – that of uncritical deductive coding, where researchers 'shoehorn' data into the established flow framework – is not uncommon in the social sciences. In their classic text, *The Discovery of Grounded Theory*, Glaser and Strauss (1967) suggested that, whilst researchers necessarily have 'theoretical sensitivity' in a subject area, they should work hard to generate theory that *fits* the data; that *works* for, and is *relevant* to, the research participants. This research was therefore conducted in the *spirit* of grounded theory, though for reasons explained below, we were unable to apply all the methodological procedures prescribed by some commentators (cf. Weed 2009 and Holt & Tamminen 2010). Rather, we recognise that the application of grounded theory remains philosophically problematic (Thomas & James 2006) and, following Piggott (2010), applied a critical version of the method, including inductive (or open) coding, iterative analysis and theoretical sampling. The sample was therefore selected for theoretical reasons, whereby elite professional golfers – those who are most likely to experience flow and able to articulate such experiences with intensity and clarity – were sought.

Sample

The participants were 10 white male professional golfers from England (*N* = 6), the Republic of Ireland (*N* = 2), Scotland (*N* = 1), and Belgium (*N* = 1). These players, either currently (*N* = 7) or previously (*N* = 3), held a European Tour card (i.e., played full-time on the European Tour) for at least one full season (range = 1-24 seasons; Mean = 10.7; *SD* = 7.5). The European Tour is the flagship professional golf tour in Europe and one of the major golf tours worldwide, involving world-class playing standards and the highest level of competition. The mean age of the sample was 37 years, ranging from 23 to 58 (*SD* = 13.08). Five players had won tournaments on the European Tour (*N* = 10); three had won on the Challenge Tour (*N* = 4); and two players had won tournaments on the Senior Tour (*N* = 31)[2]. Six of the sample had career-best world ranking positions inside the top 120 (range = 18-116), nine had competed in Major championships, and two had represented Europe in the Ryder Cup on a total of four occasions. These participants were sampled because the authors had more access to European Tour players than members of the Ladies' European Tour (see below).

Procedure

Ethical approval for the study was granted by the school and faculty ethics committees at a British university. Due to the difficulty in gaining access to players at this level, who are often in the country for short periods with busy schedules, the sampling strategy was practical as well as theoretical. However, as the research progressed, the nature of the interviews changed in order the 'test' the emerging substantive theory. The participants were contacted sequentially, through a range of

[2] The Challenge Tour is a European-based professional tour used as a training ground for promotion to the European Tour (i.e., the second "tier" in Europe); and the Senior Tour is the primary European-based professional golf tour for competitors over 50.

gatekeepers (Saunders, 2006). Initially, players were contacted through personal connections of the first author (e.g., members at golf clubs where participants were based; $N = 5$) and later through contact with a sport psychologist (the fifth author; $N = 2$) and a management agency which was contacted via email ($N = 1$). The two remaining participants were approached by the first author either before (e.g., in the clubhouse during practice days) or after tournaments which he attended. This author was sensitised to the game of golf through a number of years' experience at a relatively high amateur standard which helped him approach these players and develop rapport (e.g., by being familiar with their terminology and understanding their etiquette).

All interviews were organised at a time and place that was convenient for the players (most of which took place in clubhouses in the UK). Five interviews were conducted at tournaments, either before the tournament began (i.e., before or after the players practiced; $N = 4$) or during the tournament ($N = 1$; after the first competitive round). The remaining five interviews took place away from a tournament setting. All participants provided written consent after the researcher explained the purpose of the study, and data were collected until theoretical saturation was deemed to have occurred (Coté *et al.* 1993). The interviews were conducted face to face and digitally recorded, while brief notes were also taken during. The interviews lasted 53 minutes on average, and were later transcribed verbatim.

Interview Guide

Development of Interview Guide

An interview guide was developed based on details provided by previous studies (e.g., Chavez, 2008; Jackson, 1996), and addressing key issues which emerged from

a recent review (Author 1 *et al.* 2012a). A semi-structured, open-ended approach was adopted to allow the interviewee to elaborate and develop areas of perceived importance, while also using specific probing questions where necessary to gain further data (e.g., Sparkes & Smith 2013). While following a general guide, a conversational and open-ended approach was adopted by the interviewer (i.e., first author) to develop rapport and allow new themes and discussions to emerge (cf. Potter & Hepburn 2005). Before the interview began, the participants were encouraged to challenge and clarify any assumptions or terminology used by the interviewer which did not correspond to their experiences.

Interview Questions

Previous studies have reported that the majority of their samples have not been familiar with the term *flow*, and what being in flow means (e.g., Jackson 1992). To ensure that the participants understood which specific states they were being asked to describe, and to use terminology they could most easily relate to, they were first asked if they were familiar with the term *flow*. If not, other terms were used which researchers have previously employed interchangeably with flow, such as 'flowing', being in 'the zone', or in 'the groove' (Jackson 1992, 1996; Jackson & Csikszentmihalyi 1999; Young 2000) and they were encouraged to use the terminology which they were most familiar with. The participants were then asked to provide one example of such a state which stood out in their memory, and the interviewer then judged whether or not this was flow (as defined by the research team) based on their descriptions. Some players used their own terms (e.g., "the bubble"), but all descriptions were judged to refer to flow.

A series of questions were then asked regarding what the flow experience is like (see Appendix 1). The open-ended approach meant that these standard questions

were used to guide all interviews, but other themes and discussions were also allowed to emerge and were incorporated into later interview guides. Consistent probes were used to develop deeper understanding and to encourage participants to elaborate (e.g., Author 2 *et al.* 2011), including "can you tell me a bit more about that?" and "can you explain what you mean?"

Pilot Study

The guide was piloted with two elite golfers: one competed professionally on the Challenge Tour, and the other represented England at elite amateur level and had competed in The Open Championship. The pilot study led to changes in the sequencing of questions, and the use of more specific and direct probes (above) in order to follow up areas of interest that emerged. The pilot data were not included in the subsequent study as the participants were not European Tour players.

Analysis

A research team (made up of the first four authors) was used to guide the analysis process. The first author, who conducted the interviews, was most familiar with the data and enhanced this through a process of "in-dwelling" by reading and re-reading the transcripts (e.g., Maytuk & Morehouse 1994; Author 2 *et al.* 2011). The data were then stored in, and analysed with the assistance of NVivo 8 qualitative data analysis software (QSR, 2008), and a process similar to that set out by Braun and Clarke (2006) was followed. First, initial *codes* were identified within the data, before they were inductively sorted and combined into *higher-order themes.* The same process was followed in sorting these themes into substantive *categories*, which described the experience of flow for these participants. The other members of the team were provided with the transcripts periodically throughout the study, which

offered a broader perspective on the data, as well as critical evaluation of the main analyst's interpretations during peer debriefing (see below).

Consistent with the constant comparison process in grounded theory, codes, themes and categories were identified as the analysis progressed *without* trying to fit the data into the existing flow framework. Whilst 'purely inductive' analysis on a phenomenon such as flow is arguably impossible – that "researchers cannot free themselves of their theoretical and epistemological commitments, and data are not coded in an epistemological vacuum" (Braun & Clarke 2006 p.84) – we deliberately sought to prevent or delay pre-existing ideas about flow (and its dimensions) from 'steering' coding decisions. In the spirit of Glaser and Strauss (1967) we aimed to avoid 'shoe-horning' data into the nine dimensions of flow, and instead to identify themes and categories that emerged inductively, which could then be compared to Csikszentmihalyi's framework. Finally, we note that the participants were assigned randomly-chose pseudonyms, to which they are referred below.

Establishing Trustworthiness

The term *trustworthiness* has been used by qualitative researchers to describe methods used to ensure quality in their work (e.g., Harrison *et al.* 2001; Sparkes & Smith 2009, 2014), and a number of steps were taken to establish trustworthiness in this study.

Peer debrief was conducted throughout, between the first author (i.e., lead investigator) and the second, third, and fourth authors who provided on-going guidance on the research process, critical evaluation of the data, and challenged the researcher's assumptions (Creswell & Miller 2000). This process took place through regular formal meetings between the research team, and informal discussions with each member individually. In keeping with the grounded theory-inspired approach (Piggott, 2010), the purpose of the meetings was to aid the constant comparative

process and ensure *fit* and *relevance* (Glaser 1978). For example, a number of conversations debated the best way of coding themes, as well as the most suitable labels for these themes (i.e., did the label accurately reflect the content?).

While peer debrief was concerned primarily with the on-going *process* of collecting and analysing the data, "critical friends" were asked to critique and provide feedback about the *results* of these processes (Smith & Caddick 2012). First, engaging in dialogue with the participants was seen as an opportunity for elaboration, affirmation, and disagreement, in order to enhance credibility. This dialogue centred on the fairness, appropriateness, and believability of the researchers' interpretations of the data and analysis (Smith & Caddick 2012). For example, the participants were asked if the themes and categories made sense, and whether the overall account was realistic and resonant with their experiences. Due to the difficulty in gaining access to these players (see above), this process took place by returning the transcripts and a copy of the results to the interviewees via email. This process did not suggest any modifications to the results or analysis, and participants expressed strong agreement with the findings.

Second, the fifth author was not involved in the analysis so that he could offer a more independent and critical evaluation of the results, with the aim of enhancing transparency and trustworthiness. This author had extensive experience working as a sport psychologist with professional golfers, and was therefore asked to comment critically on the findings in relation to his knowledge and experience of elite golf. Only minor amendments were suggested (e.g., inconsistencies in labelling of certain themes).

Results

The Experience of Flow in European Tour Golfers

The primary purpose of this study was to explore qualitatively perceptions regarding the experience of flow in European Tour golfers. Table 2 presents each of the categories identified, in terms of their higher-order themes and raw data codes. Each category is then discussed below in terms of its higher-order themes (in italics), while also using direct quotes from the raw data to illustrate.

[Table 2 near here]

Altered Cognitive and Kinaesthetic Perceptions

This category was reported by all players, and the most common theme was *visualising well* while in flow:

> I remember being at The Open…standing on the 17th tee…seeing the flight of the ball…I saw it in the air, I saw where it was going to land, I saw where it was going to finish. And I kept replaying that picture in my head. When I (hit) the shot…looked up, and the ball was on a washing line just exactly where I wanted it to go (Jason).

Some golfers reported differences in their visual perception during flow compared to normal, including *magnified visual clarity* which involved seeing the ball-flight in the air with greater clarity, or seeing the hole "like a bucket". *Visual narrowing* also described a tunnel vision or "blinkers" effect: "when you're in free-flow...all you see is the flag…definitely your focus zooms in on things a lot more, you don't see the outer things like crowds" (Sam). The golfers referred to *altered perception of time*, whereby the whole experience either went by quickly or slowed down, with some reporting that their swing felt like it was in slow-motion during flow. A further cognitive theme was *loss of memory*, whereby some players did not remember hitting certain shots or had difficulty remembering their performance after flow.

Some players noticed a *sense of lightness*, in terms of the club feeling lighter, and feeling physically lighter during flow (e.g., light on their feet). Players also reported that they *feel enhanced physically* during flow: "You do feel as though you're bigger…you're stronger, you're fitter, you're quicker" (John). Other themes included *feeling calm* or *relaxed* during the experience, while others reported feeling *adrenaline* and being energised. In some cases, flow involved both of these themes at once: "I felt very, very calm even coming down the stretch…your adrenaline's pumping but you're still quite calm" (Rory). As such, flow for these players was perceived to involve an individualised, optimal level of physiological activation.

Awareness and Management of Flow

This category was reported by seven participants, describing themes including *awareness of playing well without analysing the situation*: "You're aware that you're having a better day than normal, but it's only an awareness. It's not a specific of: "how well am I doing?" It feels good, that's enough…I don't need to know any more" (Jason). These players emphasised that although they were aware something positive was happening, they consciously wanted to avoid recognising just *how well* they were doing: "it's a mental decision not to try and find out what the score is...just so that you're hitting every shot exactly the same" (John). The players also reported wanting to *maximise flow* in terms of their performance and its duration: "The main thing is that once it hits you, you just want to squeeze it until the last hole, you want to make it last…You want to maximise it…if you're on a roll you've really got to capitalise on it" (Chris). These themes suggest an awareness of being in flow, and even the possibility that the players could *manage* their flow states as the experience was happening: "I remember at The Open…being absolutely in the zone…and I was determined to finish (the round) in the zone" (Jason).

Enhanced Intrinsic Motivation

Enhanced intrinsic motivation, discussed by all participants, was experienced during and after the performance. During the performance it was characterised by a continuous *desire to keep shooting lower:* "when I get to six under I want to get to seven, when I get to seven under I want to get to eight, I want to keep going up" (Luke). Similarly, the players experienced a moment-by-moment eagerness or excitement to carry on the performance in that they *don't want the performance to end*, and *can't wait to play the next shot.* Intrinsic motivation also remained after the performance as some players *can't wait to play again*, e.g., in the next tournament. *Increased motivation* reflected the players' heightened motivation or determination to raise their game, or get more out of themselves, in response to a challenging situation: "(I'm) motivated…very up for it…my intensity is increased" (Luke).

Enjoyment and Intrinsic Rewards

This theme was discussed by all participants, and typically referred to *enjoying the experience* and *having fun. Intrinsic rewards* were also reported, describing the positive affective or emotional outcomes of flow, i.e., they were noticed or experienced after flow had occurred. These remained with the player for a period of time after the performance, and could lead into following performances as a very positive influence, as Mark suggested: "That experience…gave me so much confidence that I went on from that and I was nearly unbeatable for a while. I mean it was wonderful". *Intrinsic rewards* also referred to other positive outcomes of flow that the participants experienced, including pride, satisfaction, and a sense of accomplishment: "It's something that everyone kind of strives to get, and when you're in that situation...you just love it. There's no better place to be" (Adam).

Confidence

Flow was described by all participants as a time of heightened confidence. This component could develop during the performance, described by the themes *confidence in what you are doing, confidence/trust in technique*, and *trust/commitment to the shot*:

> You can see the flag, and it doesn't matter where it is on the green; it doesn't even concern you that there's water twelve feet to the right...You see the shot that you want to hit, you can see the flight of the ball, and you know that you're going to hit it exactly down that line (Jason).

Other themes described *knowing that a putt would go in* or more broadly, *knowing that the performance was going to go well*: "I went to (a tournament) feeling really, really good about my game. And literally from the first wedge that I hit on the practice ground...I knew I was going to have a good week. It just felt right" (Jason).

Perceived Challenge

This category was reported by all players, and included the themes *playing in more important tournaments*, and *challenging situations*, e.g., being in contention to win. Such situations "certainly increase the intensity…I've always performed well in the Ryder Cup situation for example" (Luke); and "(you) feel as if you are in the zone more if you are playing with one of the bigger players maybe and with bigger crowds around you" (Adam).

Automaticity

Automaticity was reported by all participants, referring to performing on autopilot, instinctively, and requiring little or no conscious effort. This *automatic processing*

was described in relation to decision making (e.g., shot selection and reading greens), and executing technique automatically:

> The putt that I holed to win the Ryder Cup...was very much in the zone...It was all instinctive...At that moment in time...the only thing in the world for me was the ball and getting it in the hole, there was nothing else (Luke).

Similar was the perception of *ease/effortlessness* in the performance: "It's just very effortless, you don't have to think about anything at all...everything just seems very easy…I guess subconsciously everything comes to you without even having to look for it" (Chris). *Performing without analytical thought* was also important: "when you're in the zone you're pretty much thinking of nothing…your thoughts are clear" (John); while Michael expanded: "I've always got a really empty mind, like it's really, really empty….so I'll walk (with my) eyes on the horizon…not really thinking about anything."

Absence of Negative Thought

This category encompassed themes of *absence of worry, fear, pressure,* or *expectation,* which were reported by all players. These doubting or negative cognitions are commonplace during normal performance, but their absence signified one of the positive elements of the flow state: "I'm not worried about anything...If I hit a bad shot I don't think 'Oh God, what's happened there?'…When you've got that good feeling nothing worries you…one little bit" (Mark).

Absorption

Absorption was discussed by eight participants in terms of the becoming immersed in the performance. Some golfers discussed *losing track of the score,* or what *stage of the round* they were at, and *not noticing what was going on around them*: "You

don’t know what the other guy’s shot; you don’t know whether he’s playing good (or) bad…You don’t hear him swear, you don’t see him throw a club…you’re in your own world” (Jason). Others discussed being *immersed in the performance*, as Charlie described: “It was probably the most in tune to the golf course I’ve ever got...I was just able to feel the course (and) get the pace of the greens right, understand the wind, get the clubbing right.”

Positive Feedback about Performance

This category described feedback regarding the progression of their round, and was reported by all participants. This could be rather broad (e.g., in relation to their objectives within the performance), for example: “you know things are happening positively and correctly” (Charlie). Similar themes included *feeling comfortable with how the performance is going* (e.g., the player being happy with the shots they are hitting), and a perception of *everything falling into place.* The players also reported more specific *feedback about technique* during flow, illustrated by quotes such as “I’m very clued in to my technique, I’m very aware of my technique, and my technique is easy” (Luke) and “my swing was just there, it was in the right place” (Jason).

Heightened Concentration

Heightened concentration during flow was identified by all golfers, and included themes of *focus on the next shot, focusing on the target, focus on the task at hand,* and *staying focused.* This category was described as: “focusing purely on what you’re doing…what shot you’re trying to hit, where you’re trying to leave it, and basically...your mind’s full with just the task in hand” (Rory). Similarly, Michael

described how: “it’s just this point in time that you’re at, with this one shot in front of you, that’s all you’re concentrating on.”

Perceptions of Control

This category referred to a subjective perception of being in charge or in control, either of their *game, the situation,* or *themselves,* illustrated by quotes such as: “You’re in control of your emotions, you’re almost in control of what’s happening…It’s almost like you can bend the ball in the air with your eyes it’s that strong” (Charlie); and “Once you hit [the ball] you know where it’s going to land almost” (John). This perception was referred to by all ten golfers.

Performance Objectives

Performance objectives were discussed by seven golfers and referred to aims or goals that directed the players’ actions during flow. Themes included *general objectives* such as trying to win the tournament, and more specific *situational objectives:*

> I haven’t missed a cut...in the last...13 or 14 events...and I think of those 13 or 14 I’ve had to birdie the last (hole) five or six times...My old caddy used to tell me that when I *have* to do something I tend to go and do it, and I suppose that is being...in the zone (Michael).

Finally, the players reported that they selected much more *specific targets* than normal for each shot when in flow.

Observable Characteristics of Flow

Additionally, some players reported they could observe others (e.g., playing partners) in flow, essentially suggesting that flow states are observable. All participants explicitly suggested this idea, reflected by quotes such as “you can see

it; you can definitely see it" (Charlie); "if someone was in the zone you'd definitely be able to tell" (Michael); and "I can see who's in it and who's not, it's pretty obvious" (Chris). Seven categories described this idea, which Table 3 presents in terms of their raw data codes and higher-order themes.

[Table 3 near here]

Some players noticed *quietness* in other golfers in flow: "It's the quietness about the way they go about their business. It's kind of peaceful and efficient…there's no real idle chat…because they're totally into what they're doing" (Charlie). They could also identify flow through *body language*, and noticed that players in flow were better at *dealing with distractions or bad shots*: "If they miss a shot there's no anxiety or pulling away…it's done in a very calm way…there's no wincing if they miss a putt, it's all calm, quiet" (Luke). *Speed of play* either increased or there was no rush in anything the other player was doing, as well as showing *good rhythm* in their play (e.g., in their swing). Others recognised flow through the player's *facial expression*: "You see it in someone's eyes when they're in that zone, they've got…this look in their eyes when they're completely focused on what they're trying to do" (Sam). Finally, these players recognised flow through enhanced *quality of play*:

> I played with (a certain player and) I knew he was going to win. Absolutely, 100%...His game was good; he was quite light hearted on the golf course whereas normally he was quite an intense guy... He was striking the ball nicely, he had a good rhythm, his...conversation was calm, his head was calm, he didn't over react when he hit a poor shot, he was just in a happy

place, and you just sensed “this guy’s going to win”...And sure enough he went on and won (Jason).

Discussion

The aim of this study was to explore qualitatively perceptions regarding the experience of flow in European Tour golfers. Inductive analysis was employed which aimed to allow themes to emerge from the data that could *then* be compared to the existing flow dimensions. The following section discusses these findings in relation to Csikszentmihalyi’s nine dimensions and previous research on flow in sport to arrive at a clearer conceptual understanding of this state within elite golf.

Extending the Original Flow Dimensions

In comparison to Csikszentmihalyi’s dimensions, some categories identified inductively in this study were not clearly accounted for, meaning that they may *extend* the flow framework within elite golf.

Altered Cognitive and Kinaesthetic Perceptions

Even in the first study on flow, Csikszentmihalyi (1975) recognised that: “In some flow activities, perhaps in most, one becomes more intensely aware of internal processes...(For example) climbers report a great increase in kinaesthetic sensations, a sudden increase in ordinarily unconscious muscular movements” (p.43). Later research also suggested that “awareness of the body and its movements is often highlighted in flow” (Jackson & Csikszentmihalyi 1999, p.67). However no dimension has been included in Csikszentmihalyi’s conceptualisation to represent such sensations. The kinaesthetic perceptions reported in this study appear to be similar to the “body sensations” reported by Chavez (2008) and Bernier *et al.* (2009). Instead of describing actual physical symptoms like tingling feelings, however, this

data referred to altered *perceptions* of the body, similar to literature on physical embodiment (cf. Spinney, 2006). One of these perceptions was a *sense of lightness,* which was reported as a raw data theme by Jackson (1996) and Sugiyama and Inomata (2005) but coded into action-awareness merging and unambiguous feedback respectively. Jackson (1996) also reported a higher-order theme of "feel strong" which was coded into autotelic experience, while Jackson and Csikszentmihalyi (1999) suggested that "floating", "weightlessness" and "feeling strong" were terms that athletes used to describe flow (p.12). Data similar to feeling calm and/or energised were reported previously, including: "totally relaxed" (Jackson 1996; Sugiyama & Inomata 2005); and "endless supply of energy" (Jackson 1996). It seems that researchers have identified similar data regarding athletes' physical perceptions during flow, but these have been subsumed into other dimensions during the deductive coding process. Hence this new dimension may be warranted to account for these perceptions more specifically within elite golf, and possibly beyond.

Altered cognitive and kinaesthetic perceptions also encompassed altered cognitive perceptions, including Csikszentmihalyi's dimension *transformation of time,* as well as *loss of memory, visualising well* during flow, *visual narrowing,* and *magnified visual perceptions.* Some similar lower-order themes have been reported previously, including the theme "do not remember how movement was done," "take off board seemed larger", "distance seemed to be short" (Sugiyama & Inomata 2005), and "heightened visual perception" (Chavez 2008). Again, this suggests that an expanded dimension of altered cognitive and physical perception is warranted in better conceptualising the experience of flow in elite golf. Indeed, this dimension is

likely to also be relevant in other sports as similar themes have been reported by Chavez (2005) and Sugiyama and Inomata (2005).

Awareness and Management of Flow

Flow is generally understood to be a state which individuals only realise they were in afterwards, as "a person in flow...is aware of his actions but not the awareness itself...For flow to be maintained, one cannot reflect on the act of awareness...The person is too involved with the experience to reflect on it" (Csikszentmihalyi 1975, p.38-47). However these golfers identified that, in some cases, they *were* aware of being in flow as it occurred. Some participants even alluded to managing their flow states, including the theme *maximising flow,* which seems to be a novel idea to flow research. Once they were aware that something positive was happening, these participants reported wanting to make it last as long as they could, and to capitalise in terms of their performance. These ideas seem to contradict fundamental understanding of the nature of flow. This could result from the self-paced, stop-start nature of golf which affords players time for reflection between shots (e.g., Singer 2002), compared to faster sports (e.g., soccer, basketball) in which there may not be such time to dwell on the experience. Therefore, in golf at least, an extra dimension that describes this awareness appears to be warranted within the conceptualisation of flow.

Refining the Original Flow Dimensions

In comparison to Csikszentmihalyi's dimensions, some categories identified inductively here may provide *refined* detail and clearer coding, description, and even definition of certain aspects of the flow experience in elite golf.

Action-Awareness Merging

The categories *automaticity* and *absorption* could be compared to action-awareness merging, defined as when "one becomes so involved in what one is doing that the activity becomes spontaneous, almost automatic" (Jackson 1996, p.81). Indeed, it is this process of effortless performance "that eventually produces total absorption, or the merging of action and awareness" (Jackson & Csikszentmihalyi 1999, p.19). This total absorption is therefore represented by the corresponding category, while the "effortless", "spontaneous", "automatic" performance is represented here by *automaticity*. Furthermore, automaticity (e.g., Logan 1997) and absorption (e.g., Tellegen & Atkinson 1974) have both been studied as psychological phenomena previously, and accounting for these concepts more explicitly could add detail and clearer definition of this flow dimension in golf.

Loss of Self-Consciousness

The category *absence of negative thoughts* identified here could account for the dimension loss of self-consciousness, which describes how "concern for the self disappears when one is in flow, as do worries or negative thoughts. There is simply no attention left over to worry" (Jackson & Csikszentmihalyi 1999, p.27). Previously, coding of loss of self-consciousness has (possibly incorrectly) included the instinctive, automatic, subconscious performance (e.g., Jackson 1996; Sugiyama & Inomata 2005; see Jackson & Csikszentmihalyi 1999, p.27). Those themes were included within *automaticity* in this study (discussed above), meaning that the present coding could more clearly describe these aspects of flow within elite golf as well as avoiding certain overlaps apparent between previous coding into the original dimensions.

Challenge-Skill Balance

These golfers described flow as a time of *confidence* and *perceived challenge,* and together these categories could be compared to challenge-skill balance. The challenge aspect of this balance seems to equate to the appraisal of a potentially stressful situation to be challenging (see Peifer 2012). Furthermore, Lazarus and Folkman (1986) proposed that in order to make such an appraisal, self-efficacy must be present in the first place, i.e., confidence in ability to meet demands. Therefore this broad dimension could be compared to the two sub-categories *perceived challenge* and *confidence.* Indeed, adding this detail could more clearly account for the concept of *confidence* within the flow framework, which has previously been discussed by researchers under challenge-skill balance, clear goals, *and* sense of control (see The Experience of Flow in Sport, above). This situational perception of heightened confidence also overlaps with the concept of competence within the self-determination theory (e.g., Deci & Ryan, 1985).

Autotelic Experience and Motivation

The categories *enjoyment and intrinsic rewards* and *enhanced intrinsic motivation* could be compared to autotelic experience. Within the second of these categories, *increased motivation* emerged as a higher-order theme whereby the participants reported that they felt more motivated *during* the flow experience. While no similar themes have been found within empirical studies of how flow is *experienced* in sport, numerous studies consider optimal motivation to be a factor which facilitates or helps flow to *occur* (Chavez, 2008; Jackson 1992, 1995; Sugiyama & Inomata 2005; Young, 2000). Therefore increased motivation could be a golf-specific aspect of the flow experience, possibly due to the time afforded in this sport for reflection. Taking this into consideration, the name used here for this dimension incorporates, more explicitly, the concept of *motivation*.

Similar Categories

Four other categories appeared to be broadly similar to corresponding flow dimensions: *heightened concentration* (concentration on the task at hand)*; perceptions of control* (sense of control); *performance objectives* (clear goals); and *positive feedback about the performance* (unambiguous feedback). However some coding of lower-order themes are different to previous studies, possibly due to the different analytic approach employed. Perceptions of control did not include themes of confidence or feeling relaxed (as coded by Jackson 1996; Sugiyama & Inomata 2005); instead these were represented by their own categories. Performance objectives included similar themes to previous studies (e.g., "knowing exactly what going to do" [Jackson 1996]) but did not encompass "know as or before begin (sic) that going to be great/successful" (Jackson 1996). Instead, themes similar to this were coded here as confidence (e.g., knowing the performance would go well). Similar themes to unambiguous feedback were identified, including knowing that the performance is going well, or like everything clicks (Jackson 1996). However it did not include "Body was light and there was not very much lactic acid" (Sugiyama & Inomata 2005, p.981) which seemed to refer more to altered kinaesthetic perceptions (discussed below). Therefore clearer detail may be provided by the coding of lower-order themes in this study.

Summary of Comparison to Csikszentmihalyi's Dimensions

Athletes' reliance on the use of their body, particularly in golf at the elite level, could explain why these participants considered feelings of *calmness and/or energy*, and *altered kinaesthetic perceptions* to be characteristics of flow. Similar lower-order themes have been reported in other sports previously (see The Experience of Flow in Sport, above), but have not been formulated into new dimensions, and therefore both

of these themes may also be relevant beyond golf. *Awareness and management of flow* appears to be unique to this sample of golfers in comparison to previous research thus far, but may be typical of self-paced activities (e.g., long-distance walking; Author 2 *et al.* 2011) or endurance activities. Table 4 below summarises the categories identified in this study compared to Csikszentmihalyi's dimensions. These comparisons could therefore be initial suggestions as to how the flow model might be refined to better represent golf, and possibly even other sporting environments, in response to Jackson's (1996) call.

[Table 4 near here]

Additional Findings

A final notable finding was that flow could be an observable state. These players reported being aware of when their playing partners were experiencing flow (e.g., through changes in behaviour such as playing faster, reacting calmly to bad shots, and confident body language). Generally, in sport the possibility of observing flow could be relevant in coaching, in terms of knowing when to give advice, and when to avoid talking to, and possibly distracting, the athlete. This idea could also be relevant to practitioners (e.g., sport psychologists). Specifically within golf, it may be especially relevant for caddies who are in closest contact with the players during performance. In terms of applied recommendations, paradoxically it may be important for golfers to develop 'coping' skills for when the performance is going particularly well, and to help them maximise flow. For example, being able to 'stay out of their own way' could be important, particularly to perform well in pressure situations such as the final holes in tournaments, and avoid choking.

Limitations and Recommendations for Future Research

As with any study, there are limitations. The findings presented in this study describe the experiences of a very specific sample of 10 elite golfers, meaning that these findings cannot be generalised to any broader population. Future studies exploring flow in different levels of expertise (e.g., recreational golfers), other self-paced sports, or different types of sport (e.g., team or externally-paced sports) would certainly add to these findings. In particular, a study with full-time members of the Ladies' European Tour could explore any gender differences in the experience of flow in elite golf. Single rather than repeat interviews were used, and it would have been valuable to conduct follow-up, member-checking interviews with these participants to critically evaluate the findings (rather than conducting this process via email). While we present our interpretations of the data, others could have coded them differently and may have arrived at alternative conclusions. The emergent themes which extend the flow framework could be tested and verified in other sporting contexts. Future studies could seek to address specific issues such as whether athletes in other sports are aware of being in flow as it occurs, and whether the 'extending' categories identified here are relevant (i.e., if the flow framework can be refined) beyond golf. Such research could begin with a larger-scale qualitative study essentially replicating Jackson's (1996) work, but with the advance in understanding since then, it is arguably more useful to employ more critical inductive or abductive analysis (e.g., Meyer & Lunnay 2013) instead.

Future research could also explore whether it is possible to observe athletes in flow. For example, observations may be a useful avenue for flow research, e.g., by searching for athletes in flow to interview soon after performance, reducing the extent to which interviews are reliant on memory of experiences up to years in the past - a regular criticism of this method (e.g., Jackson & Kimiecik 2008).

Alternatively, interviews could investigate whether coaches or practitioners notice differences in their athletes' behaviour during certain (e.g., challenging) situations, to build clearer ideas of what the observable characteristics of flow may be.

References

Note: Three references have been removed to preserve the authors' anonymity

Bär, K-J., and Markser, V. Z. 2013. Sport specificity of mental disorders: the issue of sport psychiatry. *European Archives of Psychiatry and Clinical Neuroscience, 263*, S2015-S2010.

Bernier, M., Thienot, E., Codron, R., and Fournier, J. 2009. Mindfulness and acceptance approaches in sport performance. *Journal of Clinical Sports Psychology,* 4, 320-333.

Braun, V. and Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.

Catley, D. and Duda, J. 1997. Psychological antecedents of the frequency and intensity of flow in golfers. *International Journal of Sport Psychology,* 28, 309-322.

Chavez, E. 2008. Flow in sport: A study of college athletes. *Imagination, Cognition and Personality,* 28, 69-91.

Cohn, P.J. 1991. An exploratory study on peak performance in golf. *The Sport Psychologist*, 5, 1-14.

Coté, J., Samela, J.H., Baria, A., and Russell, S.J. 1993. Organizing and interpreting unstructured qualitative data. *The Sports Psychologist,* 7, 127-137.

Creswell, J. and Miller, D. 2000. Determining validity in qualitative inquiry. *Theory into Practice*, 39, 124-130.

Csikszentmihalyi, M. 1975. *Beyond boredom and anxiety.* San Francisco: Jossey-Bass.

Csikszentmihalyi, M. 2002. *Flow: The classic work on how to achieve happiness.* 2nd ed. London: Rider Books.

Deci, E., and Ryan, R. 1985. *Intrinsic motivation and self-determination in human behavior.* New York, NY: Plenum Press.

Glaser, B. 1978. *Theoretical sensitivity: advances in the methodology of grounded theory*. Mill Valley, CA: The Sociology Press.

Glaser, B., and Strauss, A. 1967. *The discovery of grounded theory*. Chicago, IL: Aldine.

Harrison, J., MacGibbon, L., and Morton, M. 2001. Regimes of trustworthiness in qualitative research: The rigors of reciprocity. *Qualitative Inquiry,* 7, 323-345.

Haworth, J. (1993). *Skills-challenge relationships and psychological well-being in everyday life.* Society & Leisure, 16, 115-128.

Holt, N., and Tamminen, K. 2010. Improving grounded theory research in sport and exercise psychology: further reflections as a response to Mike Weed. *Psychology for Sport and Exercise*, 11, 405-413.

Hyde, K.F. 2000. Recognising deductive processes in qualitative research. *Qualitative Market Research,* 3, 82-89.

Jackson, S. 1992. Athletes in flow: A qualitative investigation of flow states in elite figure skaters. *Journal of Applied Sport Psychology,*4,161-180.

Jackson, S. 1996. Toward a conceptual understanding of the flow experience in elite athletes. *Research Quarterly for Exercise & Sport,* 67, 76-90.

Jackson, S., and Csikszentmihalyi, M. 1999. *Flow in sports: The keys to optimal experiences and performances.* Champaign, IL: Human Kinetics.

Jackson, S., & Kimiecik, J. 2008. Optimal experience in sport and exercise. *In:* T. Horn, ed. *Advances in sport psychology* (3rd edition, pp.377-399). Champaign, IL: Human Kinetics.

Jackson, S., and Roberts, G. 1992. Positive performance state of athletes: Towards a conceptual understanding of peak performance. *Sport Psychologist*, 6, 156-171.

Jackson, S., Thomas, P., Marsh, H., and Smethurst, C. (2001). Relationships between flow, self-concept, psychological skills, and performance. *Journal of Applied Sport Psychology*, 13, 129-153.

Kowal, J., and Fortier, M. 1999. Motivational determinants of flow: Contributions from self-determination theory. *Journal of Social Psychology.* 139, 355-368.

Lazarus, R.S. and Folkman, S. 1984. *Stress, appraisal, and coping.* New York: Springer.

Logan, G.D. 1997. Automaticity and reading: Perspectives from the instance theory of automatization. *Reading & Writing Quarterly*, 13, 123-146.

Maykut, P. and Morehouse, R. 1994. *Beginning qualitative research: A philosophic and practical guide.* London: Falmer Press.

Meyer, S.B. and Lunnay, B. 2013. The application of abductive and retroductive inference for the design and analysis of theory-driven sociological research. *Sociological Research Online*, 18, 1, 12.

Nakamura, J., and Csikszentmihalyi, M. 2002. The concept of flow. *In:* C.R. Snyder and S.J. Lopez, eds. *Handbook of positive psychology* (pp.89-105). New York: Oxford University Press.

Nicholls, A., Polman, R., and Holt, N. 2005. The effects of individualised imagery interventions on golf performance and flow States. *Athletic Insight,* 7, 43-64.

Peifer, C. 2012. Psychophyisological correlates of flow-experience. *In:* S. Engeser, ed. *Advances in flow research.* New York: Springer, 139-164.

Piggott, D. 2010. Listening to young people in leisure research: the critical application of grounded theory. *Leisure Studies*, 29, 415-433.

Potter, J., and Hepburn, A. 2005. Qualitative interviews in psychology: problems and possibilities. *Qualitative Research in Psychology*, 2, 281-307.

QSR International. NVivo 8. 2008. www.qsrinternational.com

Saunders, M. 2006. Gatekeeper. *In* V. Jupp, ed. *The Sage Dictionary of Social Science Research Methods.* London: Sage.

Singer, R.N. 2002. Preperformance state, routines and automaticity: What does it take to realise expertise in self-paced events? *Journal of Sport and Exercise Psychology*, 24, 359-375.

Smith, B. & Caddick, N. 2012. Qualitative methods in sport: A concise overview for guiding social scientific research. *Asia Pacific Journal of Sport and Social Science*, 1, 60-73.

Smith, M.F. 2010. The role of physiology in the development of golf performance. *Sports Medicine*, 40 (8), 635-655.

Sparkes, A.C., and Smith, B. 2009. Judging the quality of qualitative inquiry: Criteriology and relativism in action. *Psychology of Sport and Exercise*, 10, 491-497.

Sparkes, A.C., and Smith, B. 2014. *Qualitative research methods in sport, exercise and health.* Oxon: Routledge.

Spinney, J. 2006. A place of sense: A kinaesthetic ethnography of cyclists on Mont Ventoux. *Environment and Planning D: Society and Space*, 24, 709–732.

Stein, G.L., Kimiecik, J.C., Daniels, J., and Jackson, S.A. 1995. Psychological antecedents of flow in recreational sport. *Personality and Social Psychology Bulletin*, 21, 125-135.

Sugiyama, T., and Inomata, K. 2005. Qualitative examination of flow experience among top Japanese athletes. *Perceptual and Motor Skills*, 100, 969-982.

Tellegen, A., and Atkinson, G. 1974. Openness to absorbing and self-altering experiences ("absorption"), a trait related to hypnotic susceptibility. *Journal of Abnormal Psychology*, 83, 268-277.

Thomas, G., and James, D. 2006. Reinventing grounded theory: some questions about theory, ground and discovery. *British Educational Research Journal*, 32, 767-795.

Weed, M. 2009. Research quality considerations for grounded theory research in sport and exercise psychology. *Psychology for Sport and Exercise*, 10, 502-510.

Young, J. A. 2000. Professional tennis players in the zone. *In:* S. J. Haake and A. Coe, eds. *Tennis science and technology*. Malden, MA: Blackwell Science.

Tables

Table 1: Examples of deductive coding in previous studies

Higher-order theme	Study	Coding	Definition
Endless supply of energy Body feels great No pain Feel strong	1,2	Autotelic experience	(A)n autotelic experience...is one that is intrinsically rewarding, one that we choose to do for its own sake (Jackson & Csikszentmihalyi 1999, p30)
Totally relaxed	1,2	Sense of control	The flow experience is typically described as involving a sense of control – or, more precisely, as lacking the worry about losing control that is typical in many situations (Csikzentmihalyi 2002, p,59)
Sense of lightness Floating sensation	1,2	Action-awareness merging	(In flow) people become so involved in what they are doing that the activity becomes spontaneous, almost automatic; they stop being aware of themselves as separate from the actions they are performing (Csikszentmihalyi 2002, p. 52)
Body was light	2	Unambiguous feedback	Feedback describes the knowledge about performance that athletes receive, allowing for continuity in pursuit of their goals (Jackson & Csikszentmihalyi 1999, p.22)

Note: 1 = Jackson (1996); 2 = Sugiyama & Inomata (2005)

Table 2: Inductive analysis of European Tour golfers' experiences of flow, with number of participants reporting each provided in brackets.

Example Raw Data Codes	Higher-Order Themes	Categories
Visualisation is easier and quicker; shots are easier to see See the ball rolling into the hole	Visualising well	Altered cognitive and kinaesthetic perceptions (10)
Your focus zooms in; you don't see much around you	Visual narrowing	
The ballflight in the air is clearer See imaginary line to the hole	Magnified visual perceptions	
Your swing is in slow motion; everything is in slow motion Time flies by a lot faster	Altered perceptions of time	
Always find it hard to remember being in flow Difficulty remembering specific shots and putts	Loss of memory	
Everything's lighter; the club feels lighter Feel physically lighter; light on your feet; light in your head	Sense of lightness	
Feel bigger, stronger, fitter, quicker Feel good physically; don't get physically tired	Feel enhanced physically	
Felt relaxed and calm; body feels calm It's a relaxed state of mind	Feeling calm/relaxed	
The adrenaline's pumping; you feel the adrenaline	Feel the adrenaline	
Aware that you're doing well but you're not clued in to the specifics - the awareness isn't specific or important You know you're doing good, sometimes you just lose count	Awareness of performing well without analysing the situation	Awareness of the situation (7)
You've got to try and capitalise on it/take advantage of it Try to make it last as long as it can	Maximising flow	
Try to push on and make another birdie Want to keep getting as under par as you can	Desire to keep shooting lower	Enhanced intrinsic motivation (10)
You don't want it to end; wish you could keep playing	Don't want it to end	
Can't wait to play the next shot	Can't wait to hit next shot	
Can't wait to get back out on the course again afterwards	Can't wait to play again	
Felt like I had to raise my game/get more out of myself My intensity is increased You're motivated and excited; feel more up for it	Increased motivation	
You're enjoying the whole process I'm enjoying what I'm doing at the time	Enjoying the experience	Enjoyment and intrinsic rewards (10)
You're having fun out there; it's really good fun	Fun	
Wonderful/brilliant experience Some of the best times I've had on the golf course	Intrinsic rewards	
You have inner confidence and belief in huge amounts Very confident in the things you do; trust in what you do	Confidence in what you are doing	Confidence (10)
Confidence in technique Trust and commitment in how I'm swinging the club	Confidence in technique	
Trust in ability to hit the shot you want Confidence/belief in the shot you're about to take on	Trust/commitment to the shot	
You know you're going to hole it; can feel it's going to go in	Knew the putt would go in	
Have this feeling that you're going to do well Knew that I was going to do well/going to win	Knowing the performance is going to go well	
When I'm in contention to win When it means something and the pressure builds	Challenging situations	Perceived challenge (10)
Playing in tournaments and bigger events Playing in Major championships or the Ryder Cup	Playing in more important tournaments	
Performing instinctively; it's like you're on autopilot Performing subconsciously	Automatic processing	Automaticity (10)
Don't think about technique; don't think about anything You've got an empty/quiet mind; there's no analysis	Performing without analytical thought	
Everything seems smooth/easy/effortless The game seems simpler; the club even feels easier to swing	Ease/effortless	

Not worried about missing, or where you hit it	Absence of worry	Absence of negative thought (10)
Not worried about the result or fellow competitors		
I'm not scared of missing putts or hitting any shot	Absence of fear	
You're not scared of winning		
Don't feel pressure, or put pressure on yourself	Absence of pressure or expectation	
Don't have expectation		
Losing track of the score	Lose track of score/stage of round	Absorption (8)
Lose track of where you are in the round		
You melt yourself into the shot	Absorbed in performance	
Forget/don't notice what's going on around you	Don't notice what's going on around you	
Don't hear distractions		
Things are going well - I knew I was doing all right	Positive feedback about progression of performance	Positive feedback about performance (10)
You feel better and better about your game		
Being in a comfort zone	Feeling comfortable with how the performance is going	
Feel happy/comfortable with what you're doing on the course		
Everything just comes into place; things are falling into line	Everything falls into place	
Everything flows		
Sense that the swing is in a good place and striking it well	Feedback about technique	
Good feeling in putting stroke; know you're putting well		
Concentrating on a specific target; focusing on the hole	Focusing on the target	Heightened concentration (10)
Focusing solely on the next shot; taking one shot at a time	Focus on the next shot	
You're completely focused on the task	Focus on the task at hand	
Focus is so much sharper/more acute	Heightened focus	
Your focus gets better; focus is multiplied		
Holding concentration; your mind doesn't wander off	Staying focused	
Control over physical and mental game	Control over your game	Perceptions of control (10)
Control over the ball and your swing		
You're in control of the situation/what you want to achieve	Control over the situation	
Totally in control of myself/ my thoughts and emotions	In control of yourself	
Try to win/beat all the other players; try to play the best I can	General objectives	Performance objectives (7)
Knew the score that was leading in the clubhouse	Situational objectives	
Knew I needed to make a birdie on the last hole		
I pick smaller/more specific targets when I'm playing better	Selecting specific targets	

Table 3: Observable characteristics of flow reported by European Tour golfers, with number or participants discussing each provided in brackets.

Example Raw Data Codes	Higher-Order Themes	Categories
For some people they get in it they don't speak, they're like robots When they are in the zone there's normally not a lot of chat from them	Less conversation	Quietness (7)
There's a quietness and peaceful efficiency in what they're doing	Quietness	
Good rhythm in their swing Rhythm in walking between shots	→	Good rhythm (7)
Arrogance and confidence in the way they do things Walking taller and in a relaxed way; their body language is really calm. It's just the way they act; they act as though everything's easy	Relaxed/confident body language	Body language (6)
You can tell by their demeanour. They carry themselves in a completely different way; they walk differently	Can tell by body language	
They walk faster and play their shots quickly There's no rush to anything	Play faster No rush	Speed of play (5)
You can see it in their eyes, like a meanness that they want it so much You can tell by facial expression; very focused and straight-faced	→	Facial expression (4)
You can tell they're in flow by the quality of shots they're hitting	→	Quality of play (3)
They don't overreact to bad shots Didn't over react when he hit a poor shot, he was just in a happy place	Calm reaction to bad shots	Dealing with distractions or bad shots (2)
They just don't get affected by anything going on around them. Once they get over the shot you know they're ready to hit, and nothing's going to put them off	Don't get distracted by anything	

Table 4: Comparison of present findings on flow in elite golf to Csikszentmihalyi's dimensions.

	Csikszentmihalyi's Dimensions	Present (Inductive) Findings
Similar	Challenge-skill balance	Perceived challenge Confidence
	Autotelic experience and motivation	Enjoyment and intrinsic rewards Increased intrinsic motivation
	Action-awareness merging	Automaticity Absorption
	Loss of self-consciousness	Absence of negative thoughts
	Clear goals	Performance objectives
	Unambiguous feedback	Positive feedback about performance
	Concentration on the task at hand	Heightened concentration
	Sense of control	Perceptions of control
Extended	*Time transformation*	Altered cognitive and kinaesthetic perceptions
		Awareness and management of flow

Note: italics represent Csikszentmihalyi's original dimension which was encompassed within the corresponding category identified in this study.

Appendix

Initial Interview Questions

- Are you familiar with the term “flow”?
    - If not, are you familiar with the terms “flowing”, being in “the zone”, or in “the groove”?
- Can you provide an example of one such experience which sticks out in your memory?
- In as much detail as possible, can you describe what these experiences are like?
- What are the most distinguishing characteristics, or clearest indicators of being in flow?
- What are you most aware of during flow?
- What are the most notable differences between being in and out of flow?