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To cite this article: Urban Johnson, Göran Kenttä, Andreas Ivarsson, Ingela Alvmyren & Marcus Karlsson (2016) An ultra-runner’s experience of physical and emotional challenges during a 10-week continental run, International Journal of Sport and Exercise Psychology, 14:1, 72-84, DOI: 10.1080/1612197X.2015.1035736

To link to this article: http://dx.doi.org/10.1080/1612197X.2015.1035736
An ultra-runner’s experience of physical and emotional challenges during a 10-week continental run

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(Received 6 February 2013; accepted 26 March 2015)

The main purpose of this study was to investigate relationships between self-report measures such as mood state, emotional recovery, and perceived exertion for a runner during a continental run. Second, the purpose was to examine psychological factors that enable an ultra-distance runner during an event. A case study report from a 49-year-old female ultra-distance runner, running a 3641 kilometre adventure event during a 10-week period was made. Data were collected during 15 weeks with three self-report questionnaires – more specifically, an initial report 3 weeks prior to the run, a weekly report during the 10 weeks of running, and, finally, a report 2 weeks after the run. In addition, a follow-up narrative interview was performed nine months after the run was completed. The main result showed that perceived exertion level had a statistically significant negative relationship with negative mood and a positive statistically significant relationship with positive mood. Results also showed a statistically significant difference between the three measurement points based on the variable perceived exertion level. In addition, the runner’s narration suggested four main categories of psychologically assisting attributes: motivation, group cohesiveness, self-awareness, and mental stamina. The findings highlight the complex balance between extreme physical load and feelings of comfort and elevated mood. Another finding is that the joint effect of different psychological factors – especially the runner’s high self-awareness, strong-minded attitude, and ability to use humour in problematic situations – was helpful during the run. Practical and methodological implications, as well as strategies for further research, are provided.

Keywords: psychology; narratives; ultra-distance running; self-reports

An ultra-runner’s experience of physical and emotional challenges during a 10-week continental run

Running as exercise is widely acknowledged to enhance physical health and psychological well-being. It is well established that physical activity reduces the risk of developing diabetes, hypertension, colon cancer, coronary heart disease, and osteoporosis (The European health report, 2009). In addition, from a psychological perspective, exercise is known to reduce the level of perceived stress (Morgan, 1987). In more recent clinical research, exercise protocols result in positive treatment effects on clinical depression (Blumenthal, 2011). Moreover, research shows that exercise has numerous positive effects on our mental health (Biddle, Fox, & Boutcher, 2000). Many dedicated runners speak of experiencing euphoria-like sensations, often referred to as a “runner’s high”, which can be explained by the opioidergic mechanisms in the brain (Boecker et al., 2008).
All of the aforementioned positive health effects have been shown by studies where the level of exercise is kept at a moderate level (i.e. 30–45 minutes of moderate exercise three times per week). Increased levels of exercise do not improve health automatically, however; in fact, people engaging in long periods of and/or high-intensity training loads (up to 20–30 hours/week) will increase the risk of negative consequences. High training loads increase the risk for the athlete to develop injuries, especially overuse injuries, because bodies, muscles, and joints are highly stressed in never-ending attempts to improve physical capacity (Alonso et al., 2010). Moreover, the athlete is at an increased risk of developing overtraining symptoms, although overtraining symptoms are considered to be caused by not only physical stress, but are also highly affected by psychological (Kreider, Fry, & O’Toole, 1998) and social factors (Kenttä & Dieffenbach, 2008; Kenttä, Hassmén, & Raglin, 2006). Keeping this issue in mind makes it vital to study what psychosocial factors influence an athlete’s perception of vigour, fatigue, and mood state during an ultra-distance run.

Psychological markers have proven to be a reliable and effective source of measurement when looking for signs of overtraining syndrome (O’Connor, 1998). Mood states are reported to be highly sensitive to changes in training loads, and the variation in mood often correlates with variations in physiological markers in a dose-response fashion. Monitoring mood states in combination with physiological markers therefore is often used in athletic settings to monitor overtraining processes (Kenttä & Hassmén, 1998). The profile of mood states (POMS, McNair, Lorr, & Droppleman, 1992) is a frequently used and reliable self-report measure that monitors mood-state changes in athletes in order to detect early signs of and prevent overtraining. Although the POMS focuses mainly on negative emotions, there is a recently developed instrument that focuses entirely on positive emotions in relation to recovery: the Emotional Recovery Questionnaire (EmRecQ, Lundqvist & Kenttä, 2010). It is suggested that the EmRecQ offers a potential to monitor the recovery process by accounting for positive emotional processes previously neglected by the POMS.

Fatigue can be described as an individual’s inability to continue functioning at her normal level of abilities (Hawley & Reilly, 1997) and is an inevitable part of long-distance running often reflected in higher total mood disturbance (TMD). Fatigue during exercise was long considered to be mainly physical in nature, suggesting that it was physiological changes within the body causing the inability to function at a normal level (Edwards, 1983). Hermansen and Osnes (1972) noted that a high level of uncompensated metabolic acidosis in the muscles when exercising at maximal level was a product of fatigue. More recent studies, however, suggest that earlier theories were inappropriate because they demonstrate that decreased capacity in bodily functions when exercising is evident only in extreme cold (Cheuvront & Haymes, 2001). With these findings in mind, researchers suggested that perceptual feelings of fatigue are controlled by the brain, and that the human body functions as a complex system during exercise (Noakes, St. Clair Gibson, & Lambert, 2005). Noakes et al. (2005) suggest that when a human being exercises, there is constant communication between different physical systems and the brain, and that it is the central nervous system that determines the pacing and termination of the exercise in order to ensure that homoeostasis is maintained. For example, a high level of metabolic acidosis in the muscles is perceived as discomfort, and thus increased discomfort to a certain level makes the brain decide to terminate the exercise. The sensation of fatigue could therefore be seen as an essential factor influencing the pacing strategy in long-duration events in order to maintain performance capacity until the end (Baron, Moullan, Deruella, & Noakes, 2009). Pacing strategies influenced by sensations of fatigue and discomfort seem to be crucial in optimising competitive performance on a day-to-day basis (i.e. daily form) in most short-to-long-distance events (Hettinga, de Koning, Hulleman, & Foster, 2012).
Ultra-running is an extreme form of running with races covering a wide range of distances from approximately 50 kilometres for a daily event all the way up to events covering thousands of kilometres and lasting up to several months. These races are most often of a competitive nature, but there are also ultra-runners who take on long runs in a more adventurous way, such as doing a cross-continental run, for example. Any type of ultra-running exposes the athletes to extremely high levels of physiological stress; for instance, ultra-endurance races generally lead to decreased body mass (Beat, Duff, Schulze, Rosemann, & Senn, 2009; Knechtle, Enggist, & Jehle, 2005) and a reduction of the skeletal muscle mass (Knechtle & Kohler, 2007), possibly increasing the risk for developing overuse injuries. Training stress in combination with non-training stressors (i.e. psychological stressors) results in an elevated risk of developing overtraining syndrome (Kenttä & Hassmén, 1998). There are reports of high dropout rates during ultra-endurance runs due to overuse injuries of the lower limbs (Beat et al., 2009), as well as a reported history of a higher number of bone-stress injuries compared to half-marathon runners (Micklefield, Hugo, Johnson, Noakes, & Lambert, 2007).

Early studies on ultra-running focused mainly on the monitoring of physiological factors and changes in the human body (e.g. Davies & Thompson, 1986). More recent studies, however, have focused on psychological factors in relation to extreme running events. For example, the relationship between mood and ultra-marathon performance was investigated in a study that collected data using the POMS measure (Micklewright et al., 2009). The study showed an increase in confusion immediately before the race, and a large increase in TMD immediately after the race, with a high increase in fatigue and confusion, as well as a reduction in vigour. There was also a relationship between the runners’ performance expectancies and their post-race mood state. More specifically, those expecting to enjoy the feeling of completing the race experience a positive effect on their post-race mood state, whereas those with expectations to complete the race at a certain time and failing to do so experienced a negative post-race mood state. It has also been noted that ultra-endurance sporting events/competitions often lead to athletes experiencing pre-race tension and post-race fatigue (Parry, Chinnasamy, Papadopoulou, Noakes, & Micklewright, 2011). Moreover, other studies have shown that mood is affected by conscious thoughts about the competition outcome – its success or failure, in relation to preparation (Micklewright et al., 2009; Parry et al., 2011).

Ultra-run races and long-distance adventure races such as the Alpine Ironman and the Patagonian Expedition Race are becoming more and more popular as an alternative to traditional one-event one-day competitions (e.g. the London Marathon). Although the traditional long-distance competition has gained attention in the research community, there is still sparse research focused on ultra-running, especially when it comes to research focusing on psychological strategies used to complete such demanding events. Thus, it is important to advance the knowledge about these phenomena. It is suggested that case studies using self-reports on a weekly basis during long-distance events, in combination with retrospective narratives, would develop the base of knowledge. Consequently, we claim that the mixed-method design is particularly efficient and suitable in this study because of its potential to help us interpret the meanings and quality of interviews and at the same time encapsulate qualitative variables that cannot easily be quantified in the same study. During the last 10–15 years, interest in mixed-method designs has increased in social and behavioural research in sport, and several well-cited studies have been published (Tashakkori & Teddle, 2010). We believe this methodology has the possibility to stimulate further research in the area and to encourage cross-disciplinary research.

The main purpose of this study was to investigate relationships between self-report measures – such as mood state, emotional recovery, and perceived exertion – of a runner during a 10-week ultra-run. Using narration, a secondary objective was to examine what psychological factors enable a runner during an event.
Methods

Participant

Data were collected from a female, 49 years old, with a background as a marathon runner at an international level, who had finished her elite career in 2005. This was her first ultra-distance run, and it was completed across the European continent. For the continental run, she teamed up with a running partner and mentor. He was a highly experienced ultra-distance runner, 55 years of age, who had completed numerous adventure runs (e.g. running across the American continent). A third runner participated in this event for a limited time, from days 48 to 61.

Description of the run

The total distance of the adventure run was 3641 kilometres, completed during a period of 71 days (approximately 10 weeks). The run was performed during the period April–June and varied in terms of temperature mostly depending on the altitude (Alpine versus lowland) and geographical position in Europe (south versus north). Only five days were rest days: days 19 and 20, because her running partner was injured, and days 61–63, when the partner had a private commitment. On day 50, the running was interrupted briefly with a short train ride to a nearby town to meet up with close family.

The daily running distance ranged from 26 to 80 kilometres, with an average of 55.1 kilometres. A typical day would contain 5–8 hours of running, starting around 10 a.m. and finishing around 7–8 p.m., with two stops or more for food and relaxation along the way. A bike computer mounted on a baby jogger was used to measure the distance. Running speed varied between approximately 5 and 8 minutes per kilometre, depending on the nature of the terrain. Before the adventure started, the time to complete the run was estimated at 12 weeks, based on a running distance of approximately 4000 kilometres, taking into account time for unexpected events, hassles, and rest days, if necessary.

Practical and logistical processes

The runners limited themselves to sporadic phone calls and text messages to family and friends and weekly reports to a running magazine. Their daily tasks consisted of planning food preparation and intake times, moving forward by running or walking, and maintaining personal hygiene in order to stay healthy. The athlete and her partner spent approximately half the nights in their own tent and the other half in hotels.

All of the equipment was transported in a baby jogger. The total weight of the equipment (including the baby jogger) was just above 40 kilogram and included clothes, a tent, sleeping equipment, a camera, food, water, and other necessities. The runner and her running partner took equal turns pushing the baby jogger in front of them while running, except when hilly terrain made it too physically demanding. During these stages, the male running partner pushed the baby jogger.

The original plan was to carry all of the equipment by themselves, select roads with less traffic, and primarily run in the countryside because it was difficult to move the baby jogger in urban areas. Tents were used if no suitable hotel or hostel was available. Equipment for cooking was carried initially, but was dropped by the end of first week because of the weight.

Several running strategies were outlined before this event, which were based on the running partners’ experiences and on the motto “We are going to last all the way home”.

Examples of the strategies are:

- not setting a specific target distance for each day, but rather letting the feeling and circumstances decide the day (e.g. available accommodations, weather conditions),
- treating injuries and illnesses as soon as they emerged, thus preventing serious and long-lasting negative consequences,
- using equipment of only the highest quality (e.g. running shoes) to reduce the risk of injury,
resting if necessary for whatever reason,
• walking the uphill slopes, especially steep ones, and
• allowing themselves to sleep until awakening, thus letting the body self-regulate the amount of sleep.

Instruments

POMS. The POMS (McNair et al., 1992) was administered to monitor mood states. The POMS consists of 65 items, divided into six mood factors. The factors are: (1) tension, (2) depression, (3) anger, (4) fatigue, (5) vigour, and (6) confusion. Answers are rated on a 5-point Likert-type scale, ranging from 0 (not at all) to 4 (extremely). A global score for TMD is calculated by subtracting the vigour score from the sum of the remaining subscales. To prevent a negative score, a constant of 100 is added to the global score. In the present study, the runner completed a Swedish version of the 65-item POMS inventory according to how the previous seven days had been, including the day of assessment. In the analysis, TMD was used as an indicator of negative mood state.

EmRecQ. The EmRecQ (Lundqvist & Kenttä, 2010) was administered to monitor positive mood states. The inventory consists of 22 items, divided into five factors. The factors are (1) happiness, (2) security, (3) harmony, (4) love/appreciation from others, and (5) vitality. The answers are rated on a 5-point Likert-type scale ranging from 0 (not at all) to 4 (extremely). EmRecQ was completed using the same criteria as for POMS. In the analysis, the total EmRecQ was used as an indicator of positive mood state based on a sum of all subscales.

The Borg 6–20 RPE scale. The Borg 6–20 RPE Scale (Borg & Borg, 2002) was administered to monitor perceived exertion. The scale is a 15-point scale, ranging from 6 (no exertion at all) to 20 (maximal exertion). The runner was asked on a weekly basis to rate her global perception of exertion based on the entire duration and intensity.

Narrative interview. The Narrative-oriented inquiry method (NOI) was used for the interview. It emphasises that narratives are not just a form of qualitative data or a special procedure for analysing data, but a methodological technique (Hiles & Cermák, 2008). This form of qualitative research explores meaning and experiences that are connected to the narrative that have the potential to give a deeper understanding of an event or phenomenon (Smith & Sparkes, 2009). More specifically, the narrative perspective assumes that story-telling plays an important role in human activity. Stories often dominate human discussions and are a fundamental process for organising and structuring human experiences and actions, as well as a meaning-making process important for understanding a person’s reality (Jowett & Frost, 2007).

The purpose of using the NOI method was to encourage and stimulate the runner to describe the ultra-run and reflect upon the psychological factors that assisted and supported her while she followed through with the 10-week run. Thus, a low-structured interview guide was developed with three specific, and one general, dimensions, partly based on a mental toughness framework’s dimensions and subcomponents developed by Jones, Hanton, and Connaughton (2007). That is, questions were developed such as:

What attitude or basic way of thinking is important to use when doing such an extensive challenge?

“Could you tell us what help you had from your mental toughness preparing yourself for the challenge?” “Could you tell us what help you had from your mental toughness during the challenge?”

Could you tell us what help you had from your mental toughness after the challenge – for instance, in coping with success or failure?

Monitoring procedure. The runner completed the three assessment forms weekly (i.e. the POMS, the EmRecQ, and the Borg 6–20 RPE scale) for a period of 15 weeks: 3 weeks prior
to the run, 10 weeks during, and 3 weeks after the run. The runner completed the forms on the same day every week, and at approximately the same time. The runner had no previous experience with any of the forms, and therefore one of the researchers gave appropriate instructions and was available to answer any questions the first time the runner completed the three forms before the ultra-run started. Approximately nine months after the completion of the ultra-run, an in-depth interview that lasted 1.5 hours was carried out.

**Ethical considerations**

All information was treated confidentially. The subject remains anonymous in the quantitative and qualitative data retrieved from the questionnaires and the interviews and the personal journal presented in this paper, all of which were read and approved by the subject before they were included in the study to ensure privacy and confidentiality. In addition, a final draft of the manuscript was sent to the runner, as well as to her running partner, and accepted by them before submission for publication to any journals.

**Data analysis**

The program simulation modelling analysis (SMA) was developed to analyse short time series data streams containing a minimum of approximately 10 observations (Borkardt et al., 2008; Nash, Brockardt, Abbasa, & Gray, 2011), and we used it to perform the statistical analysis. SMA uses a bootstrap procedure to analyse: (1) effects of different phases on one specific dependent variable or (2) cross-lagged correlations between variables over time. In the analyses, the results are corrected for autocorrelations within each variable. For a more specific description of the programme, see Brockardt et al. (2008). In the current study two different types of analyses were performed. First, we investigated if the phases (pre-, during, and post-running) had different impacts on the three variables: perceived exertion level, positive mood, and negative mood. For this analysis, all weekly reported scores were labelled based on the different phases (pre-, during, and post-running). Second, a cross-correlation analysis at lag 0 (i.e. cross-correlation between the two constructs measured at the same time point) was used to investigate the relationship between perceived exertion level and (1) positive mood and (2) negative mood. All analyses provided Pearson’s $r$ effect sizes together with $p$ values. In this study, results where $p$ was less than .05 were taken as statistically significant.

The process of analysing the narrative was based on seven steps consistent with the NOI method (Hiles & Cermák, 2008): Step 1: the author confirmed the research question; Step 2: a semi-structured narrative interview guide was constructed; Step 3: the interview was recorded to generate an audio text; Step 4: the interview was transcribed verbatim to produce a raw transcript; Step 5: the raw data units were read through several times and segmented and numbered in chronological order to build up both a picture of the emerging themes and a picture of the story as a whole; Step 6: a Fabula/Sjuzet analysis was initially performed separating the what (Fabula) and how (Sjuzet) in the narrative; and Step 7: the researchers reflected upon what factors could have influenced the participant during the interview.

In our analysis, the focus will be on the categorical content, which is one of the perspectives of the Fabula/Sjuzet analysis (Step 6), investigating what psychological factors influence the runner’s perception during the long-lasting, physically and psychologically demanding, ultra-run. That is, no analysis was performed of the pre- and post-run stages of the adventure run.

**Results**

The result section is organised in the following way: First, the results from the statistical analyses are presented. Second, the data from the narrative are presented based on the categorical content
of the narratives. During this process, distinct segments and parts of the different meanings are separated from the rest of the text.

The results showed that perceived exertion level had a significant negative relationship with negative mood \((r = -0.67, p = 0.02)\) and a significant positive relationship with positive mood \((r = 0.52, p = 0.04)\). These results show that high levels of perceived exertion are correlated with more positive mood states.

The results from the simulation tests, where the potential differences between the pre-running and running phases were tested, showed a statistically significant difference in perceived exertion \((\text{Mean pre-running} = 11.0; \text{Mean running} = 15.4, r = 0.82, \ p < 0.001)\). No statistical difference was found in either positive mood \((\text{Mean pre-running} = 88.7; \text{Mean running} = 97.0, r = 0.44, p = 0.14)\) or negative mood \((\text{Mean pre-running} = 108.0; \text{Mean running} = 97.0, r = -0.55, p = 0.07)\).

The results from similar simulation tests, where the potential differences between running and post-running phases were tested, showed that there was a statistically significant difference in perceived exertion \((\text{Mean running} = 15.4; \text{Mean post-running} = 12.0, r = -0.66, p = 0.002)\) and in positive mood \((\text{Mean running} = 97.0; \text{Mean post-running} = 78.0, r = -0.70, p < 0.001)\). No statistical significant difference was found in negative mood \((\text{Mean running} = 97.0; \text{Mean post-running} = 104.5, r = 0.41, p = 0.13)\).

**Categorical content of the narrative**

In the runner’s narrative, eight attributes were identified as assisting and supporting her to follow through the 10-week period. The attributes were sorted into the following four main categories: motivation, group cohesiveness, self-awareness, and mental stamina.

**Motivation.** This category describes how motivation helped the runner during the ultra-run. The quote below captures the essence of self-determined motivation and expresses the personal enjoyment of challenging and testing one’s physical and psychological abilities in demanding situations:

> Somehow I enjoyed the difficulties … It gave me something to … To be an adventure there should be a 50% chance to make it through. Otherwise it is not an adventure. (…) More difficulties bring more use of mental toughness. For that reason it was exciting when it became tough. Because I knew that I [would] not make it if I [were] not mentally ready. (Segment 33)

The runner also emphasised the importance of enjoying the experience itself:

> I really just wanted to run. The more I ran – the more I wanted to run. It was never the way I thought before I started – that I would feel exhausted, tired, and it would be monotonous, and that I would like to rest all the time. It was never like that. (Segment 30)

Another quote is about challenges and testing one’s limits:

> …I knew that I did not do this to show other people that I could. I did it for my own sake. I expected it to be fun, and sure it was. I wanted to observe how my body reacted. This was the reason why I ran a marathon for the first time. I did it because I wanted to know…. (Segment 91)

**Group cohesiveness.** This category describes how feelings of relatedness and closeness between the two running partners helped her during the ultra-run. The quote below captures the runner’s ability to work together as a team and focus on the process of running:
It became natural to use unwritten rules on how to work together. We were a team, and we did not have to say that now we stay and rest – we just knew when it was the right time. We never talked about how long to run or what distance we had covered. This was never expressed, it just happened, and suited us very well. (Segment 48)

Another quote in the category Group Cohesiveness relates to humour and its positive effect, helping the runner to cope with difficulties during the ultra-run.

We made light of things, to make them more enjoyable. For instance when we had a rather very hard time passing the first mountain chain in Spain the Pyrenees were really big and troublesome. At that time we said that the Pyrenees did not exist. We joked about it. It was just something that we made up. Humor was probably also a way to handle or master the situation. (Segment 52)

**Self-awareness.** The category self-awareness describes how the runner’s self-awareness helped her during the ultra-run. The runner seemed to adjust her activity level based on her daily fitness (form) and how she felt when running.

You should never run longer than needed in order to make the next day enjoyable. We never talked about being mentally tough – Let’s do it! It was never like that. This was one of the things I learned from my partner. (Segment 54)

If trouble arose, the runner evaluated the situation in order to make the right decision and avoid potentially dropping out of the ultra-run, because of, for example, a severe injury:

... even the slightest feeling of discomfort would make us stop. You were not allowed to take one more step if you felt any symptoms whatsoever. So when I felt that I was in pain, I directly stopped and said to my partner, “My Achilles tendinitis hurts”. My partner told me to stop, and then we just put up the tent in the forest. “We do not go one step further”, he said. (Segment 61)

**Mental stamina.** The category mental stamina describes how perseverance helped the participant during the ultra-run. According to the runner, one of the most important attributes is “not giving up” (Segment 3). The runner later continued, explaining that “because challenges will come all the time ... and you should have just one thought – and that is to go all the way to the finish line” (Segment 4).

**Discussion**
The main purpose of this study was to investigate relationships and differences between self-report measures, such as mood state, emotional recovery, and perceived exertion, by a runner during a 10-week continental ultra-run. Using narration, a second purpose was to gain insight into what psychological factors assisted and supported the runner to follow through the challenging event. The data indicate that the perceived exertion level had a statistically significant negative relationship with negative mood and a significant positive relationship with positive mood. Results also showed a statistically significant difference between the pre-running and running phases based on the variable perceived exertion level, where a higher level of perceived exertion was reported during the running phase. Moreover, the result showed statistically significant differences between the running and the post-running phases in the two variables of perceived exertion and positive mood. More specifically, the runner reported a higher perceived exertion level as well as a more positive mood during the running phase than during the post-running phase. The narrative analysis suggested four main categories of psychologically assisting attributes: motivation,
group cohesiveness, self-awareness, and mental stamina. Motivation and the positive attitude towards personal challenges helped the runner during the ultra-run in demanding situations. In addition, other helpful components were her high self-awareness, mental stamina, a continually maintained sense of humour, as well as adjustments to the activity based on her daily health status, together with the tight unity (cohesion) between the runners.

The data clearly indicate that the runner enjoys running! High perceived exertion levels correlate with not only a more positive mood, but they also appear to contribute to psychological benefits such as activation of adaptive coping strategies (e.g. humour, high self-efficacy). The close relationship between the two runners also seems to make them well equipped to withstand all demanding situations and events. Moreover, the runner’s experience of high mental stamina seems to help her throughout the entire run. In contrast to previous research on runners competing in ultra-run races who report high levels of stress on the body, which in many cases leads to overuse injuries (Beat et al., 2009), the runner in this study basically stays healthy during the entire 10-week run. This state of good health possibly suggests that the runner’s overall high positive mood facilitates functional recovery and prevents injuries from occurring in this case. Pre-run high tension and confusion are seen in ultra-endurance sporting events (Parry et al., 2011), as is a reduction in vigour after the run ends (Micklewright et al., 2009). These observations are also noted in the present study, and seem to vary greatly according to different internal and external demands affecting the runner during the run. Despite a very high physical and psychological load, the runner reported no signs of staleness or overtraining syndrome during the run. Support from previous research indicates that overtraining is caused not only by physical stress, but highly affected by psychological and environmental factors (Kenttä & Dieffenbach, 2008). The changes in mood observed in the descriptive statistics (see Figure 1) seem unrelated to an increase in physical load.

Another interesting matter in the narration is the positive emotional experience in combination with a seemingly high self-awareness that the runner expresses. It is well known from research that prior expectation of an event also leads to subsequent behaviour (Micklewright et al., 2009). That is, if the ultra-run is expected to be an enjoyable event, it is likely that a positive pre-mood state will also remain during the race, perhaps even leading the runner on “the right

![Figure 1](graph.png)

Figure 1. Graphic presentation of the runner’s mean values for the POMS, EmRecQ, and Borg scales.
(track’” in the beginning of the run. Subsequently, a positive emotional experience of well-being, vitality, vigour, and self-determined achievement is continuously maintained during the run. This seems to capture the experience of the runner. On the other hand, if expectations are on reaching a goal in a pre-defined time or positioning oneself in a certain ranking in relation to other runners, negative mood levels will probably arise during the race that may put the runner in a potentially stressful situation if the expectations are not met.

Compared to athletes in competitive sport settings, where the perceived level of pressure is normally high, especially before and during important competitions, there seems to be low to modest outside pressure on the runner to complete her ultra-distance run. The only commitments made were to send weekly reports to a running magazine and to make sporadic phone calls to family and friends; there were no other expectations to communicate with the outside world, nor had the runner set or spoken of any performance goals other than making it all the way home. A stress-free environment with only a few daily tasks and covering basic needs (i.e. moving forward, eating, and finding a place to sleep) appears to increase the positive mood and the feeling of comfort, leading to high running efficacy and a seemingly injury-free run. In relation to Jones and colleagues’ mental toughness framework (2007), and particularly to the question related to attitudes of importance during an extensive competition/challenge (see method section), it is interesting to reflect on the overall effect of the four main identified categories in relation to the achievement of the long run. For the runner, it is obvious that having high internal motivation, nurtured by high self-awareness and efficacy of competence, as well as closeness, and complete trust and confidence in her running partner’s experience and competence, supported her throughout the event. It is obvious that the runner’s high inner motivation, her high self-efficacy and competence, as well as her close relationship to her running partner and a complete trust of his competence were all helpful to the runner throughout the entire event. Her running partner’s vast experience of successfully completing several adventure runs (e.g. running across the American continent), and therefore being used to handling different adversities, helped her believe that it was possible to complete the run and avoid setbacks along the way.

It is also interesting to note how consistently the runner used humour in various forms to regulate her positive mood, emotions, and perceived exertion. This cognitive coping strategy appears to be a key ingredient in her mental make-up, guiding her through different obstacles. From the quotations related to group cohesiveness and humour, it is also apparent that the runner’s joyfulness and seemingly positive attitude, shared with her running partner, underline the usefulness of adaptive coping strategies during the run.

The runner presented no signs or symptoms of overtraining during the run. Considering previous research into the human body’s ways of adapting to stressful situation, there is a chance/risk that the negative effects on the body were postponed because of the nature of the event. The runner had Achilles tendinitis before the run and was feeling pain and discomfort during the first few days of the run and then nothing for the remaining period. As soon as the run was over, the Achilles tendinitis came back in a much more severe way than before she had started the run.

Summing up, the longitudinal, single case study of a female distance runner’s way during a continental ultra-distance run revealed several thought-provoking points. The most interesting finding is that although the physical load on the body increased, a positive psychological mood response occurred. Another interesting finding is that the joint effect of several different psychological factors – including high self-awareness, a strong-minded attitude, and the ability to use humour in problematic situations – helped the runner get through the run.

Study limitations. Conducting a single case study certainly brings problems when generalising the result to a broader population. However, the purpose of the study was not to generalise our data, but instead to learn more about what psychological factors influence an athlete’s perception
of vigour, fatigue, and mood state during a long-lasting, physically, and psychologically demanding ultra-run. The combination of long time, repeated measures using psychometric evaluation tools with an in-depth narration analysis has the potential to answer our research question. However, the data sampling period for pre- and post-running contained only a few measurement points, which is a potential limitation, increasing the risk for single events to have a substantial influence on the overall results (Nash et al., 2011). Another methodological issue to consider is the runner’s surprisingly low overall TMD as well as rather high EmRecQ scores in comparison to published norm data (see Terry & Lane, 2000; Lundqvist & Kenttä, 2010). Published norms, however, should not be used to make comparisons of the runner to the population in general. An ultra-runner is, metaphorically, miles away from the norm, and her data should be analysed only at the intra-individual level. Still another issue with the study is the fact that the male runner’s life-partner joined the group for 13 days (about weeks 7–8 of the run), changing the group structure, possibly disturbing the harmony and flow between the two runners. In fact, the appearance of a third person seems to have affected, in some ways, the general mood and emotional state of the runner. The psychometrics indicate a negative slope of the EmReQ during this period; the curve, however, rather promptly seems to reach normal shape again after the other runner’s partner left the group. This emotional reaction emphasises the potential influence of psychosocial stressors in association with physiological stress. Finally, the rather long time span between the completion of the run and the interview (approximately nine months) could potentially make it hazardous to analyse the combined effect of the different data units. However, the time allowed the runner to process her ultra-run and to gain some perspective on her achievements, it is our belief that this approach strengthens rather than weakens the design.

The paper adds important information about a seldom scientifically studied event: ultra-running outside of the competitive arena. There is a steadily increasing interest (Green & Jones, 2005) in highly physical and psychologically demanding events attracting athletes and fitness enthusiasts to test their limits without using time, ranking, competition among participants, or gaining recognition for their efforts. For that reason, it is hoped that this new study will gain attention and interest from other researchers to study this phenomenon because it is important to know more about the sensitive interplay between different psychological attributes that assist a runner in completing an ultra-run. A suggested next research strategy could be to use the same or similar psychological measures, but to add a comprehensive set of physiological, biomechanical, and other related measures in order to capture a more complete psycho-bio-physiological profile of an ultra-distance runner. Also monitoring subjects during a more extensive period after an ultra-run could be of use to investigate the long-term effects of the event. We believe the paper adds a solid description of how the joint effects of several psychological factors aided the runner to avoid receiving overuse/acute injuries or other somatic problems. This base of knowledge helps us to understand possible antecedents to injury outcome in ultra-running and thus may assist other runners to avoid an injury outcome.

References


