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A 3,000-Mile Tour of Mental Toughness: An autoethnographic exploration of mental

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toughness intra-individual variability in endurance sport

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Abstract

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2 Mental toughness has garnered considerable attention over the past two decades because of
3 the perception that this psychological construct influences an athlete's ability to strive, thrive,
4 and survive in sport. However, few researchers have explored the lived experiences of mental
5 toughness within endurance sport. Analysis of lived experiences could help reveal how an
6 athlete demonstrates (or does not demonstrate) mental toughness in real-world settings and
7 provide insights for researchers, coaches and athletes in the future. The current
8 autoethnographic approach offers an alternative perspective to supplement the existing mental
9 toughness literature, and provides the most appropriate format to analyze the within-person
10 mental toughness element at the core of this research study. The study recounts and analyses
11 the personal experience of mental toughness across a trilogy of cycling, triathlon, and running
12 endurance events by a single athlete over a 5-month period. The main findings focus on the
13 variability of perceived mental toughness at different stages of competition and training and
14 identify potential factors driving the notable fluctuation in levels of mental toughness. Factors
15 involved in increasing mental toughness included anger, love, competition, encouragement
16 and the recognition of a last chance to achieve meaningful goals.

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18 Keywords: Narrative of self, Emotion, Endurance athlete, Variability

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1 **A 3,000 Mile Tour of Mental Toughness: An autoethnographic exploration of intra-**
2 **individual mental toughness variability in endurance sport**

3 “A cyclist is coming up behind you pretty quickly... it looks like it is the
4 Germans.”

5 I was six days and over 2,500 miles into the annual Race across America
6 (RAAM), a 3,000-mile event that includes 170,000 feet of elevation change and every
7 possible weather condition conceivable. “The Germans” were the four-person German
8 team with whom we (my race partner and I) had been battling against for the past three
9 days. Their rider was approaching at double my current speed in what looked like
10 would be a permanent move. I had begun this most recent section of the race at the
11 very last strand of my physical rope. My head and shoulders were slumped, my legs
12 barely pedaling – and then only when necessary to keep the bike from stopping
13 altogether. I was spent physically, and any remnants of what I thought was my mental
14 strength appeared to be long gone. Unfortunately, we still had 500 miles to the finish
15 line, and my teammate was lying prostrate in the follow-vehicle and was in no better
16 position to pick up the slack.

17 The purpose of this autoethnography is to portray and connect my personal experiences
18 of competitive endurance sport through both information and my opinions of what happened
19 over the course of five months and three endurance challenges (the RAAM, qualify for the
20 Hawaii Ironman World Championship, and run a sub-three-hour marathon). By revealing real
21 stories, I hope to evoke “in readers a feeling that the experience described is lifelike,
22 believable, and possible” (Ellis & Bochner, 2000, p. 751). Moreover, I aim to analyze my
23 tales in the context of existing psychological literature to help me (and the reader)
24 understanding the psychological nuances that both facilitated and impeded my performance

1 and how these changed as a function of a variety of person-situation interactions. I came to
2 understand these nuances in terms of my fluctuating mental toughness.

3 **Mental Toughness**

4 Before considering my story, it is essential to introduce the concept of mental
5 toughness. Athletes, coaches, and sports fans have long acknowledged the idea that mental
6 toughness is important for performance. While mental toughness may be a controversial
7 topic in some respects (i.e., a “catch-all” for numerous positive psychological constructs:
8 Jones, Hanton & Connaughton, 2002); we refer to the lexical hypothesis and assert that
9 because mental toughness is part of athletes and coaches’ language it is relevant to that group
10 and is therefore worthy of study. The lexical hypothesis (John, Angleitner, & Ostendorf,
11 1988) states personality characteristics that are important to a specific group (e.g., athletes)
12 will become part of their language. Furthermore, the fact that mental toughness has been
13 encoded into a succinct phrase (rather than listing subordinate constructs) also suggests that
14 mental toughness is important to athletes and coaches.

15 Gucciardi, Hanton, Gordon, Mallett, and Temby (2015, p. 28) defined mental toughness
16 as “a personal capacity to achieve consistently high levels of subjective (e.g., personal goals
17 or strivings) or objective (e.g., sales, race time, GPA) performance despite everyday
18 challenges and stressors as well as significant adversities.” Gucciardi, Peeling, Ducker, and
19 Dawson, (2016) suggested that researchers (e.g., Hardy, Bell, & Beattie, 2014) have recently
20 focused attention on the observable behaviors or actions that are typically demonstrated in
21 challenging or demanding situations. For example, mental toughness might be associated
22 with perseverance, effort, and persistence in the face of adversity. Gucciardi (2009)
23 suggested that rather than treating mental toughness as an objective personality construct or a
24 post hoc explanation of a given behavior, researchers should consider mental toughness as a
25 process that involves person-situation interactions. These interactions influence an athlete’s

1 sport participation and lifestyle and ultimately make significant contributions to one's ability
2 to achieve goals (or not as the case may be). Therefore, it is important to examine athletes'
3 real-world experiences across ranges of person-situation interactions that are appraised as
4 both positive and negative experiences to help scholars and practitioners understand mental
5 toughness processes.

6 Despite these suggestions, few researchers have examined mental toughness or mentally
7 tough behavior in the context of real world (i.e., not lab-based) endurance sport (with Crust,
8 Nesti, & Bond, 2012; Jaeschke, Sachs, & Dieffenbach, 2016, being notable exceptions).
9 Jaeschke et al. interviewed 12 ultramarathon runners and provided a snapshot of the
10 challenges and demands they face. For example, Jaeschke and colleagues identified
11 perseverance and persistence, overcoming adversity, perspective, life experiences,
12 psychological skills use, and camaraderie in the ultra-community as salient experiences of
13 ultramarathon runners' mental toughness. Similarly, Crust et al. (2012) interviewed 12 ultra-
14 endurance walkers and revealed that being stubborn and tenacious, totally committed to goals,
15 objective, humorous, challenge focused, able to maintain perspective in adversity and
16 possessing humility, were identified as key components of mental toughness. The differences
17 in mental toughness experiences and perceptions across separate endurance events suggest
18 that mental toughness could be situation specific. Moreover, how endurance athletes report
19 their experiences of mental toughness may support Gucciardi's (2009) contention that person-
20 situation interactions influence an athlete's sports experience. Thus, rather than describing
21 mental toughness development or the traits associated with mental toughness, researchers
22 may better serve athletes and practitioners by exploring specific situations in which perceived
23 mental toughness did (or did not) manifest.

24 An additional consideration for scholars and practitioners is the crucial difference
25 between real-world experiences and arbitrary lab-based behaviors, namely the personal

1 meaning ascribed to the action. It is highly likely that real endurance events involve different
2 motivational processes (compared with arbitrary behaviors) that change how individuals
3 interact with the environment and utilize their psychological resources. For example, a runner
4 may compete in marathons because of more internalized motives (i.e., enjoyment or identity)
5 and that same participant may not have the same types of behavioral regulations to lift a static
6 weight (i.e., Crust and Clough, 2005). Thus the application of psychological resources (e.g.,
7 coping) might be different (for example approach vs avoidance coping) in the two scenarios
8 which could result in very different “mentally tough” behaviors. Specifically, perseverance
9 when running, and quitting when holding a weight. The person-situation interaction
10 influences the outcome of a given event. The contention that person-situation interactions
11 drive the mental toughness process highlights a problem with existing research where there is
12 a propensity for between-person (rather than within-person) comparison, which mostly ignore
13 the salience of a given situation.

14 A further limitation with existing (qualitative) mental toughness research in sport is that
15 participants often create a hypothetically mentally tough straw man rather than discussing
16 real-world experiences (Anderson, 2011). Anderson (2011) stated that mental toughness was
17 an idealized, selective, and fantasy construct detached from realistic accounts of human
18 experience. With this statement in mind, Andersen (2011) critiqued Jones et al. (2002) by
19 suggesting that Jones and colleagues’ participants used a set of social imperatives to list what
20 mentally tough athletes should (or should not) do rather than personal tales of what the
21 participants do. There are exceptions to this in the qualitative mental toughness research (e.g.,
22 Swann, Crust, & Allen-Collinson, 2016), in which actual lived experiences of mental
23 toughness were studied. Swann and colleagues (2016) examined the lived experiences of
24 mountaineers who had survived an avalanche on Mount Everest in 2015 and revealed the
25 mountaineer's psychological responses to the disaster. Despite providing an excellent account

1 of the lived experiences of the event, Swann et al., (2016) identified that such extreme adverse
2 and traumatic circumstances are unlike conditions in most other sports settings. Furthermore,
3 this study looked at the overall role of mental toughness in response to the avalanche rather
4 than any situational variability of reaction.

5 Within-person state differences in mental toughness is not a new concept. Gucciardi,
6 Hanton, Gordon, Mallett, & Temby (2015) collected data on mental toughness, thriving,
7 psychological health, and goal progress from university students over a 10-week period.
8 Results revealed 56% of the variance in mental toughness was attributed to the within-person
9 variability across the ten weeks. Gucciardi et al. (2015) suggested that the results of their
10 study supported Harmison's (2011) belief that that mental toughness is a mindset that varies
11 across situations and over time and that people bring a dispositional aspect of mental
12 toughness to their interactions with the environment. This contention is supported by data
13 collected from elite youth tennis players who were based full time in a performance academy
14 (Weinberg, Butt, Mellano, & Harmsion, 2017). Thematic analyses suggested that players felt
15 they could be mentally tough in some situations and not in others.

16 By reflecting on several different events and specific situations during a 5-month period
17 and the subsequently perceived variability in the perceived mental toughness that I
18 experienced during the races and in training, I hope to overcome the critical point that
19 Andersen (2011) identified (i.e., real vs idealized mental toughness). Also, I hope to provide
20 evidence that mental toughness is not about superhuman performance but is reflected in the
21 everyday events and that mental toughness is dependent upon what I bring to the event and
22 my interaction with the environment. By focusing on the within-person variability of mental
23 toughness in a generally depleted physiological state rather than between-person comparisons
24 in a single-session performance measure (i.e., shuttle test), I aim to help build on the

1 established research and set the stage for continued development of mental toughness as a
2 process rather than an outcome (or label).

3 **Methods**

4 **Epistemology, Ontology, Data Analysis, and Autoethnography**

5 Regarding epistemology and ontology, this study is built on the interpretivist
6 perspective with the integration of subtle realism, which focuses on confidence in validation
7 rather than certainty (Angen, 2000). My clinical and athletic background had included
8 extensive training in exercise physiology, kinesiology, and anatomy, which I applied across a
9 wide range of endurance events over thirty years. This experience as an endurance athlete,
10 physical therapist and athletic trainer meant that I was confident, but not certain, that variation
11 in my performance during training and competition was psychological as well as
12 physiological. The interpretive approach inherently integrates the concept that meanings
13 attributed to such experiences effectively reflect the mental constructions of the participant
14 (Smith, Sparkes, Kirkby & Phoenix, 2012) who, in the case of the autoethnography was also
15 the researcher.

16 At the time of the events noted in this autoethnography, I had spent the better part of
17 three decades, initially as a licensed physical therapist and certified athletic trainer and later as
18 an employee wellness company CEO trying to help others optimize their physical potential.
19 At age 49 years, I had more recently made an effort to do the same in my own life as a
20 masters athlete. The original intention of pursuing the events described here was to focus on
21 optimizing that same physical piece of the equation I had been helping others enhance for 30
22 years. However, it was in the midst of those physical pursuits that the critical nature of the
23 mental element came to the forefront. While experiencing moderately positive race results
24 within the context of my limited athletic background, I have never been a professional, only
25 competed in high school track because the coach was generous, have no name recognition

1 beyond family, friends, and clients, and would likely be considered “average” in terms of
2 inherent physical gifts and talents. This provided a baseline from which to more effectively
3 examine the concept of mental toughness in a real-world setting that steers clear of the “elitist
4 ideal, constructed along the lines of the romantic narrative of the ‘Hollywood hero’ athlete”
5 (Caddick & Ryall, 2012, p. 137). Instead of a retrospective, revisionist history to explain a
6 dramatic victory, this experience focuses on the variation in mental toughness within the
7 realities of three specific endurance events in an otherwise regular individual. The intention
8 of this autoethnography was not to draw a comparison between my mental toughness and that
9 of others but rather to study and potentially expand upon the within-person variability
10 previously noted in the literature (Gucciardi et al., 2015).

11 The focus of my research centers on the mental toughness phenomenon and
12 specifically, within-person variation. This study is not isolated in terms of the overall design
13 of the research programme. Rather, it is the initial phase - or launchpad - in this exploration of
14 mental toughness and its practical application across a broader spectrum. It is for this reason
15 that autoethnography provided the most authentic initial step toward this understanding of
16 within-person variability, given my epistemological standpoint. The alternative to
17 autoethnography, allowing myself to be interviewed, would not have engrossed me in the
18 process of analysis and understanding. Instead, this approach allowed me to explore this
19 aspect of mental toughness and then build on it in ensuing research.

20 Further, the unique integration of objective data (e.g., speed or race results) and
21 documentary footage intertwined with the focus on reflection provides an element not often
22 seen within autoethnography research in sport. The autoethnographic approach allowed me to
23 “Heal the split between public (and in this case, very public due to the film) and private
24 realms by connecting the autobiographical impulse (the gaze inward) with the ethnographic
25 impulse (the gaze outward)” (Tedlock, 2005, p. 467). The initial emphasis on within-person

1 variability was further enhanced by the autoethnographic “self-reflexive critique upon one’s
2 positionality as researcher inspires readers to reflect critically upon their own life experience,
3 their constructions of self, and their interactions with others” (Spry, 1999, p. 711).

4 Within this autoethnography, I recount and analyze my experiences of endurance sport
5 and mental toughness and explore how mental toughness functions when engaged in extreme
6 endurance activities. In this way, the current study can be construed as analytic
7 autoethnography (Anderson, 2006) with a flavor of evocation (Ellis, 1995) to familiarize the
8 reader with my experience and provide both researchers and practitioners with a valuable
9 resource on which to build further investigation and study. Analytic autoethnography has
10 been identified as “research in which the researcher is (1) a full member in the research group
11 or setting, (2) visible as such a member in published texts, and (3) committed to developing
12 theoretical understandings of broader social phenomena” (L. Anderson, 2006, p. 373). These
13 key elements were notably present for the primary author, with additional published text
14 visibility within the broader research team. The description noted above as analytic
15 autoethnography with a flavor of evocation was included to place the emphasis on analysis
16 without losing the evocative benefit that autoethnography provides (Mayor, 2016).

17 The format of the autoethnography “offers a way of giving voice to personal experience
18 to extend sociological understanding” (Wall, 2008, p. 38). It is a form of study effectively
19 utilized to study athletes (Allen-Collinson & Hockey, 2001; Stone, 2009) and provides a
20 valuable methodology to examine mental toughness variability and related constructs. The
21 autoethnography approach provides a complement to quantitative and other qualitative
22 research into mental toughness, such as phenomenological interviews. In terms of the specific
23 representation of the autoethnographic research, there are numerous options available, ranging
24 from poetry and performance to vignettes and short stories. We determined a layered account

1 would be the most effective due to the ability to combine the author's experience with data
2 analysis, abstract reflection and the relevant literature (Ellis, Adams, & Bochner, 2011).

3 To understand mental toughness (or the variability thereof) and to bring beneficial
4 research issues to the fore it is important that a researcher is reflective of his or her approach.
5 Brackenridge (1999) stated that reflectivity (i.e., taking account of the effect of the personality
6 or presence of the researcher on the investigation) helps the researcher locate him /herself
7 within the power dynamics of the research relationships and to adopt a healthy skepticism
8 toward the truth of his or her findings. Moreover, reflectivity and introspection are legitimate
9 sources of knowledge, and important research skills (Sparkes, 1995). Despite being
10 unobservable, methods exist by which reflectivity can become explicit. One critical aspect of
11 this reflection involved the contribution the other two authors made as critical friends. They
12 consistently questioned and helped clarify the findings throughout the process. Additionally,
13 they were able to bring out additional elements core to the research through their viewing of
14 the documentary film and analysis of the discussion in the context of applicable prior
15 research.

16 I have spent almost two decades involved in endurance sport, and much of my
17 interpretive approach stems from these years in the competitive setting where I view success
18 and failure as subjective but measurable. This stance then produces an axiological state in
19 which my values around competition and improving performance naturally created a strong
20 sense of value in identifying initial causes or catalysts toward providing a higher level of
21 mental toughness. While this could cause the reader to make assumptions about the impact of
22 culture on the mental toughness described in this document (Coulter, Mallett, & Singer,
23 2016), the focus of this study takes a different route. There is not a between-person
24 comparison made between my level of mental toughness and that of others. Instead, this
25 study remains focused on identifying the presence of the within-person variability of a single

1 individual, the primary author. It then goes on to identify potential mental toughness
2 optimizers related to those situations during which an increase in the level of mental
3 toughness being accessed.

4 The current reflections, data collection, and analysis benefitted from a variety of tools
5 and resources. Of primary benefit was the stimulated recall enhanced by a documentary film
6 of my experiences in the RAAM (Butler, 2016) that was shown in over 500 theaters across
7 the United States (1-night event) in May of 2018. The film, which has been viewed by all
8 three authors and on multiple occasions by the primary author, provided an aide memoir to
9 facilitate recall of important events and to evoke the emotions and cognitions that I felt and
10 thought while racing (Ellis & Bochner, 2000). As part of the production of the film, the
11 producer interviewed me at length both during and after the conclusion of the event. This
12 stimulated recall was enhanced further through extensive discussions with family and friends
13 who participated as crewmembers for the event, as well as radio, TV and print media outlets
14 who conducted further interviews about all three of the events noted. This multi-layered
15 recall process was complemented by a detailed review of GPS and race result data, which
16 provided additional insights into the occurrences and pacing patterns throughout the Ironman
17 and marathon events. The second and third authors contributed challenges and critical
18 considerations of my story that helped to funnel my accounts and possible representations of
19 experience into a single story of how I became aware of mental toughness and its importance
20 in endurance sport. This interaction also provided a “reliability check” (Ellis & Bochner,
21 2000) which offered new insights and reflections.

22 The potential ethical considerations tied to autoethnography have been outlined to
23 include ten foundational guidelines (Tolich, 2010). The first three of these involve consent
24 documentation, process consent and the conflict of interest tied to coercive influence. Prior to
25 writing this manuscript, all members of the team who might be identified, reviewed and

1 signed consent forms related to the documentary film and related representations. Guidelines
2 four and five note the value of an International Review Board (IRB) and commitment not to
3 publish anything they would not show the persons mentioned. The co-authors provided a
4 version of an IRB for the primary author and the primary author maintained a full
5 commitment to the second recommendation throughout the manuscript development.

6 The last five of the ten foundational guidelines focus on vulnerability of both the author
7 and other referenced individuals. The three applicable guidelines for this study include
8 exposing confidences, awareness of author's future vulnerability and assuming all people
9 mentioned will eventually read it. The author took great care throughout the process to be
10 certain these guidelines were upheld. No internal confidences were exposed beyond those
11 already represented in the documentary film, and insights were treated as an "inked tattoo"
12 (Tolich, 2010, p. 1608). Finally, the assumption all people mentioned will eventually read it
13 was firmly in place as those noted have already read the document in the rough draft format.

14 **Results and Discussion**

15 **The Trilogy of Endurance Events**

16 Before the race, I had not spent any significant time thinking about my psychological
17 preparation. I generally thought of myself (as most athletes of having a reasonably high level
18 of mental toughness, but I had not considered it in great depth. Artificially high self-
19 assessment ratings are common (Miller, 2003), providing another value to the
20 autoethnographic research approach where the focus would be on a single individual's within-
21 person variation across these various events. Throughout the endurance trilogy, the
22 importance (and frailty) of my psychological state came to the fore. Over time, I was able to
23 create a taxonomy of psychological states, skills, strategies, values, and virtues that were
24 present or absent and were employed or forgotten at various points before, during, and after

1 events. As I read more of the psychological literature, I began to see similarities with my
2 emerging taxonomy and potential sub-dimensions of mental toughness.

3 The journey began when a friend approached me about competing in RAAM as a
4 two-person team. At this point, the longest ride of my life was less than 150 miles.
5 Despite my limited experience of long-distance cycling events like RAAM, I knew
6 endurance sport as a triathlete and runner. My curiosity peaked, and a three-pronged
7 goal developed to win RAAM, qualify for the Hawaii Ironman World Championship,
8 and run a sub-three-hour (Boston-qualifying time for anyone at any age) marathon, all
9 within a five-month period. How would the body of a 49-year-old respond to the
10 physiological demands of trying to compete at the highest amateur levels in three very
11 different endurance events over such a short timeline? It turned out that what I had
12 planned to be a test of personal physiological limits took me down the rabbit trail of
13 exploration into something completely different: mental toughness. However, it almost
14 never happened.

15 **Initial Glimpse into Mental Toughness: The Wreck**

16 A freak bike wreck just six weeks before the start of RAAM resulted in eight
17 fractures to ribs, clavicle, and pelvis along with a concussion. The surgeons convened
18 over several days and decided I would be allowed to continue (after surgery) but only if
19 all remaining training was completed on an indoor bike trainer where there would be no
20 risk of an additional crash. That meant rides of up to twelve hours at a time (and 30
21 hours over a three-day period) in my basement. Twelve hours, on a bike, in a basement,
22 repeated multiple times over the final six weeks of training. While I likely would have
23 seen this as an insane form of medieval torture that I could not have possibly endured
24 six months earlier, the reality was instead an insight into personal mental toughness.
25 Having faced a possible verdict that I was out of the race due to the fractures, my mind

1 suddenly reframed these twelve-hour indoor rides to be an opportunity for which I was
2 grateful. I have always been a bit of a “grinder,” willing to put in whatever work is
3 necessary to get the job done. However, this enhanced feeling of gratefulness that the
4 opportunity to race was still alive in spite of the seeming disaster appeared to produce a
5 level of mental toughness in the final six weeks of 100% indoor training of which I had
6 not previously been aware. This was the beginning of my education into mental
7 toughness variability and the potential causes of that variability.

8 The average amateur Ironman triathlete or ultra-cyclist may spend 20-25+ hours/
9 week swimming, cycling, running and strength training, invest thousands of dollars
10 each year on equipment and supplements, and even pay a coach to design the perfect
11 training program. However, the time, energy, and funds devoted to developing the
12 psychological components of performance (if they are addressed at all) are dwarfed by
13 these physiological, technical, and technological pursuits. I was no different. I did my
14 best to dial in every possible piece of the puzzle: Power to weight ratios, pace/mile, the
15 percentage of time in the aero position, calorie intake, (and macronutrients)/hour,
16 optimal sleep strategies, and even the best chain lube to enhance power output. Tapping
17 into optimal levels of my mental toughness reservoir? Not even on the radar screen.

18 However, a lack of awareness does not equate to lack of impact. In a race of
19 3,000 miles, the bank of physiological toughness quickly runs dry, bringing the mental
20 components to the forefront as a primary differentiator (between success and failure,
21 enjoyment and misery, and personal growth and stagnation). A range of emotional
22 responses surprisingly became the catalyst for accessing unexpected and illogical
23 (physiologically speaking) levels of mental toughness throughout RAAM. Combining
24 these with the other variations in mental toughness experienced across the broader five-

1 month endurance trifecta pursuits brought the potential for a shifting, state-like form of
2 mental toughness to the forefront.

3 **The Race Begins**

4 RAAM incorporates multiple races into a single event. While the solo riders start
5 several days earlier, all teams (two-person, four-person and eight-person variations)
6 launch from the starting line in Oceanside, California on the same day. There were six
7 teams in our two-person category, with an experienced team from Denmark expected to
8 be the strongest. After we gave up an early lead, we then caught and passed them as the
9 race progressed through the desert and temperatures reached record highs (120 degrees
10 F, 49 degrees C). The next day we were informed that one of the Denmark team
11 members was taken to the hospital with severe dehydration. He recovered, but this had
12 unfortunately ended their race. We were now alone in the lead, with almost 100 miles
13 between the next two-person team and us.

14 That is where the mental side took a strange turn. As I look back, while the
15 external motivators (i.e., competitors in front of us on the road) were virtually absent,
16 my focused intensity remained at a high level. Barring a complete mechanical or
17 physical disaster, a conservative approach to the remainder of the event would result in
18 victory. There was no longer any tangible benefit to be gained by pushing beyond our
19 comfort zones. Due to a mental perspective shift, however, nothing changed regarding
20 the internal drive to keep pushing.

21 With our direct competition essentially out of the picture, we created new targets.
22 Two nearby four-person teams (made up of four rotating riders, rather than our team of
23 just two riders), one from Germany, suddenly took the place of our “real” competition
24 and became the intense focus of every waking moment of the race from that time
25 forward. With each passing mile, physiologically, the body had less and less to give.

1 Each day's "worst" became worse than the previous day's "worst" (Butler, 2016).
2 Something kept pushing me past the body's desperate plea to stop (or at least let off the
3 gas).

4 Competition plays an influential role in performance. For example, it has been shown
5 that riders who were told that they were competing head-to-head virtually with another rider
6 had a faster performance and maintained a higher level of power in the last half of a cycling
7 test (Corbett, Barwood, Ouzounoglou, Thelwell, & Dicks, 2012). Inadvertently, by shifting
8 our focus to an (albeit) artificial competitor when our real competitors had dropped out or
9 fallen behind, we were able to maintain our overall level of intensity. Perhaps there was also
10 an avoidance of social loafing (Haugen, Reinboth, Hetlelid, Peters, & Høigaard, 2016) at
11 work here as well. High mental toughness individuals have been shown to continue a high
12 level of effort even when individual results will not be identified. The strategy of artificially
13 inserting ourselves into a different category (four-person team competition even though our
14 results would only appear in the two-person category) may have been a subconscious mental
15 toughness-related strategy to move past the siren's call toward letting off the gas.

16 Interestingly, while this internal drive continued, the ability to tap into the
17 maximum level of mental toughness was far from constant throughout the 3,000-mile
18 race to the finish line. Looking back, one essential element tied to accessing that higher
19 level of mental toughness at the moment was linked to a variety of specific emotional
20 responses. At times, the emotional response was competitive ("not on my watch!").
21 Other times it was fulfilling a personal role in my head or coming to the virtual defense
22 of a loved one. On separate occasions, a burst of anger created a spark that was then
23 fanned into a blazing, powerful fire of mental focus and intensity. The various
24 emotional responses came unexpectedly, yet powerfully – and they produced a variation
25 in mental toughness that reared its head time after wonderful time.

1 **Anger**

2 The anger catalyst was the first to show itself positively. My teammate and I had
3 structured our shifts to ride 30-60 minutes at a time during the twelve daylight hours
4 (one rider on the bike while the other tries to rest/eat). Then during the twelve
5 nighttime hours, we would follow a 2/4/4/2 hour on/off schedule with some of the long
6 rides extending to five hours. This would allow my teammate to rest up heading into
7 his long pull, during which I would then try to sleep for a few hours. The process
8 would then be reversed, as he would get some sleep during my long pull and then
9 provide me with a two-hour recovery period on the backside. We were midway through
10 day three, and I was coming off my long (five hour) night pull, desperately in need of
11 some downtime. After I (very slowly) made my way to the transition on little more
12 than fumes, my teammate took over, and I crawled into the back of the car planning to
13 soak in a couple of hours of much-needed recovery. Due to an unexpected anomaly
14 within the team dynamics, I was informed a few minutes later I needed to be ready to
15 jump back on the bike at the next turn. I just about lost my head in responding. In fact,
16 tuning into the presence of the camera crew filming a documentary probably saved me
17 from making a fool of myself in my exhausted, sleep-deprived state.

18 What happened next is the fascinating part – that unexpected 90-minute pull on
19 the bike was one of the strongest I had experienced in the race up to that point. In the
20 midst of the intense anger, I had tuned the iPod in my right ear to a downloaded series
21 of audio quotes from movies like Rocky and taken off on the bike with a vengeance.
22 Brushing back tears of anger and mumbling under my breath, I remember experiencing
23 an incredible mental focus that went well beyond anything I had felt over the first three
24 days of the event. This was not merely physical as I was beyond exhaustion on that
25 front, having just concluded a 5-hour pull moments before. Nor can any credit be given

1 to a timely shot of caffeine as I strategically chose not to utilize any caffeine until the
2 final day of the race. Instead, this emotional response had brought a secondary level of
3 mental toughness that produced a robust physical outcome. Yes – I theoretically
4 brought a baseline level of mental toughness into this event. However, it was non-
5 existent just moments earlier until something provided a catalyst to tap back into
6 another level. This was a first-time experience for me as a rider, but it would not be the
7 last.

8 The positive boost the anger provided was not unique to me. Anger has been identified
9 (Ruiz & Hanin, 2011) as an emergency source of energy for athletes when physiological
10 resources are running low, providing positive effects on performance. It has also been noted
11 that rugby players viewed controlled anger as facilitating improved performance (Robazza &
12 Bortoli, 2006) and that purposeful unpleasant emotions can provide beneficial outcomes
13 (Stanley, Lane, Devonport, & Beedie, 2012). Lazarus (2000) also indicated that there were
14 times when constructive anger could mobilize performance enhancement.

15 **Love**

16 The following day of the event provided a period with similar unexpected, yet
17 incredibly productive levels of (variable) mental toughness. However, the genesis of
18 this mental toughness access was almost 180 degrees from the previous day's anger
19 catalyst. We had passed the four-person German team early in this pull, and I was
20 enjoying pushing the pace of this long morning section through the flatlands of Kansas.
21 A five-hour time for an Ironman bike section (112 miles) is a popular stretch goal for
22 triathletes, as the average time is closer to six hours (Britt, 2010). Therefore, to provide
23 an extra personal boost, I had mentally reframed this pull to see how close I could get to
24 that mileage figure during my five-hour portion. Unfortunately, 90 miles into my own

1 personal “Kansas Ironman,” our follow vehicle pulled up next to me and hesitantly
2 shared the bad news: “We took a wrong turn back there.”

3 In RAAM, the rules are precise about wrong turns. Teams cannot just redirect
4 their course to get back on track. Instead, riders are required to return to where the
5 wrong turn was made and continue forward from that original point. Caught early, a
6 wrong turn was discouraging but not disastrous. This was not one of those, as we had
7 taken the wrong turn 25 miles back, thrusting the four-person German team back in
8 front of us by at least that same distance.

9 As we scrambled to get back on track, I overheard my 19-year old daughter (who
10 was watching over the map when we took the wrong turn) say to one of our other
11 crewmembers, “I just ruined Daddy’s race.”

12 There was the spark.

13 I tried my best to remind her it was not our first wrong turn and how thankful I
14 was that she was out there with us on this adventure. Nevertheless, that did little to shift
15 her disappointment. Therefore, I went with the only thing left that I could think of,
16 promising her we would catch that German team no matter what it took, and that any
17 wrong turns would not matter by the end of the day. For the next several hours, each
18 time I hit the bike, my daughter’s voice, and face were in my head. Once again, the
19 level of available mental toughness and push that came to the forefront made no sense
20 physiologically, yet it was affecting the outcome. We caught and passed the German
21 team by that afternoon, bringing a smile back to my daughter’s face, and settling back
22 to normal intensity levels for Dad.

23 In the Individual Zones of Optimal Functioning (IZOF) model (Hagvet & Hanin,
24 2006), emotional experiences in athletes and their functional tie to performance are taken into
25 account. The model connects the hedonic tone of pleasure or displeasure with the functional

1 performance (positive/negative) to classify emotions into four categories. These include
2 pleasant-optimal, unpleasant-optimal, unpleasant-dysfunctional, and pleasant-dysfunctional.
3 The connection I am fortunate to have with my family (and in this case, specifically with my
4 daughter) appeared to play a significant role in setting the scene for this functional-pleasant
5 emotional response. The IZOF model indicates this is associated with optimal readiness and
6 effective energy utilization. A second potential explanation tied to my response might be
7 related to the core value connection of being a Dad. Schmeichel (2009) noted that thinking
8 about core values helps facilitate self-control when resources are depleted, which they
9 certainly were at this point in the race.

10 **Competition**

11 Negative, unforeseen incidents have been highlighted as enhancing mental toughness in
12 athletes (Connaughton, Hanton, & Jones, 2010). Interviewed athletes indicated these
13 experiences contributed to a clarifying of perspective, and an enhanced sense of their personal
14 “why” tied to the pursuit and achievement of their goal.

15 This brings us back to where I started this account; day six with the Germans
16 approaching. I had checked out mentally and could not care less about my speed (or
17 anything else) at this point. However, when the four-person German team rider passed
18 me, something snapped. The next 15 miles were the strongest I had experienced over
19 the previous two days. By the end of that pull, we were back in front by at least a mile
20 (or two), a lead we never again let go (in this artificially contrived, objectively
21 meaningless “race” between two teams from completely different categories who
22 technically weren’t even racing each other.)

23 Competition is a widely recognized element of enhanced performance related to mental
24 toughness. In a review of world-class athletes (Jones, 2007), mentally tough performers
25 ranked love of the pressure of competition at the top of the list in dealing with the stress of

1 competition. Hardiness, which is closely aligned with mental toughness, has “challenge” at its
2 core. This is the level to which one views challenges as opportunities (Kaiseler, Polman, &
3 Nicholls, 2009). The psychobiological model of endurance performance (Blanchfield, Hardy,
4 De Morree, Staiano, & Marcora, 2014) states that exhaustion is a conscious decision to reduce
5 intensity output rather than merely muscle fatigue. This puts a premium on the individual’s
6 motivation level regarding the resultant outcome, even six days into a 3,000-mile race.

7 Was the immediate response to the passing German team member the result of a
8 competitive drive that had been sharpened over decades of competition? Perhaps it was
9 merely an ageing Dad making a desperate push to be more than he is with his 16-year-
10 old son sitting shotgun in the follow-vehicle? Alternatively, was it the culmination of
11 thousands of training sessions and races where “one more time” was just part of what
12 we sign up for? Alternatively, maybe it was something completely different altogether.
13 One thing we know: it was not an indicator of my current physiological status nor a
14 reflection of a trait-like level of mental toughness. Whatever the sudden variation in
15 “it” was, “it” came from that vast space between the ears, changed on a dime, and was
16 influenced, impacted and optimized by a multitude of elements; some visible and others
17 left forever unseen.

18 The actual finish line of the race was somewhat anticlimactic. Of course, we were
19 delighted to cross that line finally. It was a beautiful morning, and the sun was starting
20 to rise. The announcers, our friends and family were all there to greet us. Once we
21 knew we were going to stay ahead of all two-person and the pair of four-person teams
22 we had been racing, there was only one goal left to chase: finish by a specific time.
23 That potential opportunity did stir up one last internal fire and the accompanying
24 physical benefits. However, once it was clear that the goal was out of reach, I mostly
25 stopped caring about speed, and any level of mental toughness became insignificant.

1 The last few hours were merely survival mode. Get across the line. Just finish,
2 regardless of the pace.

3 **Encouragement**

4 RAAM was over, but the broader goal was far from complete. I still had the
5 Hawaii Ironman World Championship qualification (0.7% in our category would
6 qualify), and the small task of running a sub-three-hour marathon (something less than
7 2% of marathoners across all ages accomplish, with the odds significantly lower for 49-
8 year-olds) in front of me. Also, due to the bike wreck that resulted in multiple fractures
9 to the ribs, clavicle and pelvis, I had not done any swim or run training in months, so
10 this pursuit would not be following the traditional training strategy. During the Ironman
11 race that followed RAAM, several occurrences during the initial 90 minutes of the race
12 had me on the ropes, significantly reducing any potential for earning the coveted Kona
13 (World Championship) qualification. The 2.4-mile swim, from which I typically exit in
14 a competitive position at just over an hour, took me almost ten extra minutes, dropping
15 me into the 147th place spot as I moved out of the swim and onto the bike. Things did
16 not get any better once on the bike, as the power meter I use to guide my level of effort
17 over the 112-mile ride was malfunctioning and would not provide any valuable data for
18 the duration of the bike section. It appeared my odds of earning that Kona slot had
19 shifted dramatically in the wrong direction.

20 However, two specific elements allowed me to tap into a different level of mental
21 toughness at that moment. First, my wife of 23 years had repeatedly gone beyond
22 merely providing “supportive words.” Instead, she had communicated a belief in me
23 that far exceeded my confidence in myself. Throughout the event, thoughts of that
24 belief acted like a mental toughness buoy during the most challenging periods. Add to
25 that the presence of our 21-year-old daughter, who had flown down for the event.

1 Encouragement flows naturally and genuinely from her and seeing her regularly during
2 the race influenced the level of mental toughness throughout the daylong competition.
3 As an interesting mental toughness-related side note, this year's event marked the
4 highest DNF (Did Not Finish) in the history of the event; at 26.4%, (average DF has
5 historically averaged approximately 15%). In the end, I finished 18th overall (out of
6 2,500 total competitors), a comfortable 25 minutes ahead of the time (place) needed to
7 earn the Kona qualification, in spite of being the oldest athlete in the 45-49-year-old
8 category.

9 This increase in mental toughness makes sense in the context of research showing
10 encouragement from significant others was seen as an enhancement to the development of
11 mental toughness in both the early and middle years for elite performers (Connaughton,
12 Wadey, Hanton, & Jones, 2008). More specifically, the significant others were identified as
13 those who were a source of knowledge and inspiration to the athlete, qualities that my wife
14 and daughter certainly embodied.

15 **Last Chance**

16 In the marathon, there was just one final opportunity on the calendar to close out
17 the tri-fold five-month goal with a sub-three-hour finish. It took place only two weeks
18 after the Ironman, and a post-Ironman knee issue had limited me to only a handful of
19 runs over the two weeks that separated the events. The rolling hills and winds on race
20 day were less than conducive. Nevertheless, the knee held up and something happened
21 in the closing miles that resulted in a final time of 2:59:48, just twelve seconds under
22 the target (over a 26.2-mile event – a buffer of less than .5 second/mile). The sense of
23 “last chance” seemed to spur on that next level of mental toughness, to ring out every
24 drop of energy as the clock ticked down during the final miles. I was never in a
25 position to win the race (ironically, I also finished 18th overall in this event) and the

1 only person even remotely aware of my finish time was my son, who accompanied me
2 to the event to run the half marathon. Therefore, there was no “heroism” involved.
3 However, knowing this was the only opportunity to reach this goal within the calendar
4 year influenced the level of mental toughness at a critical juncture. There would be no
5 second chance.

6 The drop-off in pace in the final six miles of the marathon have been well
7 documented (March, Vanderburgh, Titlebaum, & Hoops, 2011), and a review of my
8 splits via GPS tracking showed I was no exception to this pattern. After starting fast
9 over the first half of the race, my average pace from miles 16-18 settled in at 7:06/mile
10 but then slowed dramatically to 7:26/mile from miles 21-23. At mile 24, the level of
11 mental toughness driven by this sense of “last chance” resulted in a dramatic
12 improvement back to 7:07/mile average pace over the final 3.2 miles at a time when
13 physiological reserves were at their most significant levels of depletion. This extended
14 push resulted in reaching the goal by the previously noted sliver (12 seconds total) of a
15 time buffer under the goal.

16 Persistence, effort or perseverance appear to represent a behavioral signature of those
17 with higher levels of mental toughness (Gucciardi, Peeling, Ducker, & Dawson, 2016).
18 Similarly, in a qualitative study of ultra-runners (Jaeschke et al., 2016), the theme that rose to
19 the top regarding traits of mentally tough runners was a single word: persistence. It appears
20 that idea shone through on this day as well.

21 **Limitations and Future Research**

22 The Autoethnography as a methodology is not without critics (Das & Mullick, 2015)
23 and limitations within this form of research indeed do exist. This autoethnography was no
24 different, as it had inherent limitations. The primary author’s memory was supported by a full-
25 length film of the first event (RAAM) and family recollections for the second and third events

1 and objective, reviewable data was collected for each of the events. However, outside of the
2 film, no ongoing audio or journalized recordings were made during the events. Lab tests were
3 not performed during or immediately afterwards, to confirm the author's premise that the
4 variability noted was more related to mental toughness variability than physiological changes.
5 Finally, the concept of specific optimizers of mental toughness identified within this study is a
6 new concept in the mental toughness literature and thus did not have prior data on which to
7 draw. This naturally points to the value for future research to investigate the possibility of
8 measurable variation in mental toughness and the variety of optimizers that may enhance or
9 deplete the level of that construct.

10 **Conclusion – Why It Matters**

11 The concept of mental toughness is frequently viewed as a potentially malleable
12 (Middleton, Marsh, Martin, Richards, & Perry, 2004) but generally constant trait-like
13 construct (Hardy, Bell, & Beattie, 2014; Horsburgh, Schermer, Veselka, & Vernon, 2009). An
14 individual's level of mental toughness is said to be generally set. My findings that this was
15 not the case were explicit, and expand upon previous research pointing to within-person
16 variability (Gucciardi et al., 2015; Weinburg et al., 2017). The repeated within-person spikes
17 noted throughout this autoethnography – and particularly throughout RAAM - were not
18 physiologically oriented. They did not correspond with caffeine intake (which was avoided
19 entirely altogether until the final day of the race) or changes in blood sugar (I was eating
20 consistently throughout the event, both on and off the bike). Instead, multiple unplanned, yet
21 useful optimizers temporarily increased my level of mental toughness. I went into this trio of
22 endurance pursuits with no pre-conceived notions about mental toughness variability.
23 Instead, I was there to race, to pursue and potentially achieve a series of (I thought physical-
24 oriented) goals. Instead, the discoveries tied to the experiences (in spite of a multitude of
25 personal constants present within each event) further opened the door to the concept of

1 within-person mental toughness variability. While this study is ultimately the account from a
2 single athlete, it provides additional data on which to continue the discussion around - and
3 stimulates discussion of - the investigation into within-person variability and potential
4 catalysts of mental toughness.

5 Rather than looking to identify or measure some hidden (from the outside world)
6 element that differentiates the very best athletes from the pack, we can stop making between-
7 person mental toughness comparisons altogether. We can stop attempting to determine what
8 percentage of the outcome was due to mental toughness (versus physiology, team
9 contribution, or just plain luck). Instead, we can turn the focus of the conversation and
10 associated research toward assisting each in optimizing his or her level of mental toughness.
11 We can reduce the importance of asking which of two people has the higher level of mental
12 toughness and start working toward helping both improve their ability to access, enhance, and
13 utilize that mental toughness. At the same time, this also opens the door to the additional
14 application beyond sport (Tibbert, 2013). If within-person mental toughness is pliable and an
15 increase thus improves performance, why would it not have a similar impact on all aspects of
16 health and wellbeing? For now, these questions remain unanswered. However, the findings
17 developed in this autoethnography provide a broadened continuation of these conversations
18 initiated by the researchers who came before us and sets a potentially new course going
19 forward. Future research is needed to identify how common this variation is across a much
20 broader range of athletes and non-athletes, as well as what choices, decisions and outside
21 influences impact the level of individualized mental toughness.

22

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