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## When is mental toughness needed in judo? Perceptions of athletes and coaches with different levels of achievement

**KEY WORDS:**

Mental toughness. Situations. Judo. Qualitative. Athletes' perceptions. Coaches' perceptions.

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**RESUMO**

Considering the lack of research focused on the circumstances that require mental toughness in judo, this study's purpose was to explore the perceptions of those demanding situations between athletes and coaches. Nine coaches and 12 athletes, with different levels of achievement, were interviewed. Semi-structured interviews applied the "experience" corollary of the personal construct psychology theory. Interview transcripts were subjected to inductive content analysis. The resulting conceptual framework that arose from raw data revealed 25 mentally demanding situations in judo. Five were exclusively reported by coaches: death, parents and family, personal problems, logistics and club changing. Golden score was merely identified by athletes. Only one situation was reported among all 21 participants: results in competition. Considering the scarce available literature, four situations identified were suggested to be peculiar to judo: weight loss, unpredictability in judo fight, nature of judo fight and golden score. Additionally, rivalries were suggested to be a reality particular to the sport's elite.

Quando é que a força psicológica é necessária no judo? Percepções de atletas e de treinadores com diferentes níveis de realização competitiva

**RESUMO**

Considerando a falta de estudos sobre as circunstâncias que, no judo, exigem força psicológica aos competidores, o nosso objectivo foi explorar as percepções de atletas e de treinadores, a respeito dessas situações mentalmente exigentes. Entrevistámos nove treinadores e 12 atletas de judo, com diferentes níveis de realização competitiva. Na elaboração do protocolo de entrevista semiestruturada aplicámos o corolário "experience" da teoria *personal construct psychology*. As transcrições *verbatim* das entrevistas foram sujeitas a análise indutiva do conteúdo. O quadro conceptual resultante dos dados em bruto revelou 25 situações exigindo força psicológica no judo. Cinco foram exclusivamente referidas pelos treinadores: morte, pais e família, problemas pessoais, logística e mudança de clube. O *golden score* foi identificado só pelos atletas. Apenas uma situação foi apontada por todos os 21 participantes do estudo: resultados em competição. Considerando a escassa literatura disponível com base na qual discutimos os nossos resultados, sugerimos quatro das situações identificadas como sendo peculiares ao judo: perda de peso, imprevisibilidade da luta de judo, natureza da luta de judo e *golden score*. Quanto à situação que designámos por rivalidades, sugerimos tratar-se de uma realidade particular à elite do judo.

**PALAVRAS CHAVE:**

Força psicológica. Situações. Judo. Qualitativo. Percepções de atletas. Percepções de treinadores.

## INTRODUCTION

Considering the competitive nature of sport at the highest level of performance, confrontation against challenging environments is expected. Therefore, mental toughness is seen as a psychological edge for sport success<sup>(17)</sup>, also being the expression used by coaches, athletes and the media when they draw attention to the superior psychological attributes of those athletes who achieve sport excellence, not only in training but also in competition<sup>(13)</sup>. That is why some coaches claimed to recruit collegiate athletes on the basis of mental toughness characteristics<sup>(27)</sup>. In that context, it seems logical to identify those tough demands within each sport, considering that each particular situation may require one or another set of mental toughness attributes.

Some researchers have already investigated the development of mental toughness in particular sports<sup>(1, 3, 9)</sup> also a broader sport psychology practitioners' perspective on its development<sup>(28)</sup> and even mental toughness maintenance over time in a multisport point of view<sup>(2)</sup>. Less is known about the psychologically challenging situations which demand mental toughness from sport competitors. Moreover, considering that each sport is likely to confront athletes with some distinctive mentally defying circumstances, research exploring those situations besides being scarce is sport-specific<sup>(e.g., 13)</sup>. In soccer, for instance, players were challenged with situations such as "breaking into the reserve team"<sup>(3)</sup>, "being dropped and not considered for selection", "being selected when not expecting it" or "being sent out on loan to another club"<sup>(25)</sup>. Interestingly, according to the last authors, the exposure to environmental challenges during early competitive years was a simultaneous contribution to the development of mental toughness. However, those are situations apparently not largely relatable to typical contextual demands of an individual and combat sport like judo. As far as we know, situations in judo, which require mental toughness from the athletes, were never studied. Thus, obtaining knowledge and understanding about those circumstances in this sport would be an important contribution to the state of the art and, moreover, of practical relevance mainly to coaches and sport psychologists working with judo competitors. Due to the qualitative nature of our endeavour, we concomitantly tackle the absence of studies in judo based on that methodology<sup>(29)</sup>.

Judo derives from the Japanese martial art of ju-jitsu. Based on its martial roots, it was established in 1882 as an educational and sport practice accessible to all citizens. The Olympic debut of judo occurred in 1964 at the Olympic Games in Tokyo. Since then, governing bodies have evolved the sport world-wide at an organizational and sporting level, spreading its practice to the five continents, promoting media exposure, performing live broadcastings of the most relevant competitions, disseminating sport-specific knowledge through judo experts scattered throughout the world and improving training conditions for top-level competitors (e.g., training camps). Thus, competitiveness in judo has been rising. For instance, 726 competitors from 126 countries competed in the 2017 World Championships for 14 possible titles.

The purpose of this research was to explore and conceptualize situations requiring mental toughness in judo. So, working on a limitation spread by some authors in other qualitative researches<sup>(13)</sup> and also overcoming our understanding beyond multisport studies available in existing literature<sup>(17, 18, 27)</sup>, seeking to gain knowledge about sport-specific situations where mental toughness is necessary. Furthermore, taking into account issues raised by previous research, we arouse interviewees' opinions regarding situations demanding mental toughness from judo competitors<sup>(12)</sup>. As the authors emphasized, putting into context experiences that were personally lived by interviewees, allowed us to elicit testimonies specifically related to mental toughness.

In order to structure a diverse understanding of situations in judo that demand mental toughness from the athlete, we surveyed perceptions from two groups of interveners in the sport (i.e., coaches and athletes) involved at distinct levels of competition (i.e., regional, national and international). As is expected, non-elite coaches and athletes will be, to some extent, confronted with different types of demands, pressures, challenges and setbacks, comparatively to their elite counterparts. Regarding the acknowledgment from Thelwell, Such, Weston, Such, and Greenlees<sup>(25)</sup>, our heterogeneous sample commented on challenging situations without having to make considerations about mental toughness development. It is presumed that these different interveners in the sport will detain particular perceptions of a rather broader reality. Finally, we should take into consideration that mental toughness should also be investigated in athletes who did not thrive in high-level competition<sup>(14)</sup>.

## METHOD

### PARTICIPANTS

In order to explore mentally demanding situations within a population of both judo competitors and coaches, a qualitative approach was deemed appropriate. A purposive sampling technique<sup>(22)</sup> was used, so that a holistic insight could be gained into the sub-cultural domain of Portuguese competitive judo. A total of 12 competitive judokas (three female and nine male) and nine competition-involved coaches (all male) were interviewed in person by the first author, who invited all participants directly, either personally or by phone, to anonymously take part in a broad research on the subject of mental toughness in judo. This paper was one of the three conducted studies with this sample within our investigation. Each one of the studies addressed different goals.

We sampled participants with different levels of achievement, including in each level, four athletes and three coaches. Thus, the non-elite group brought together medallist judokas in regional championships, who had never had a medal at the Portuguese national championships, and also coaches experienced with these athletes. The sub-elite group was made up of athletes who had won at least a medal at the senior or junior national

championships, but had not accomplished any podium result in the European and world championships and also the Olympics, as well as their coaches. The elite group was put together by medallist competitors who had participated in the Olympics and/or at world and European championships, including both senior and junior age groups, along with the coaches who had already worked with this group of athletes. Among all 21 participants, we brought together seven athletes or former athletes with Olympic participation. Two out of the 12 athletes were retired. All the coaches were active and had experience as competitive judokas. The athletes ages ranged between 17-40 years ( $23.3 \pm 6.8$  years) and experience of judo practice ranged between 9-21 years ( $14.7 \pm 4.4$ ), while coaches were between the ages of 34 and 61 years old ( $44.2 \pm 9.5$ ) and had been practising judo for 23 to 44 years ( $34.6 \pm 7.6$ ). Taking into account the time of experience as a competitor, athletes competed nationally between 5 to 17 years ( $8.8 \pm 3.6$ ) and internationally for 0 to 16 years ( $5.3 \pm 5.1$ ), while coaches were former athletes who competed at national level for 6 to 26 years ( $16.7 \pm 6.6$ ) and internationally for 0 to 17 years ( $7.4 \pm 7.4$ ). Given the asymmetrical development of the sport throughout the Portuguese territory, we sampled on participants located in geographically dispersed districts: Lisbon ( $n=6$ ), Coimbra ( $n = 4$ ), Oporto ( $n = 4$ ), Braga ( $n = 2$ ), Leiria ( $n = 2$ ), Viana do Castelo ( $n = 1$ ), Autonomous Region of the Azores ( $n = 1$ ) and Autonomous Region of Madeira ( $n = 1$ ).

#### INSTRUMENT

Following previous research on sport's mental toughness<sup>(16, 26)</sup>, semi-structured and face-to-face interviews, were conducted. The open-ended questions of the interview guide were first tested on two pilot interviews, in order to assure relevant data for our study and also allowing some practice for the interviewer. Afterwards, the interview protocol remained unchanged.

One week before an interview each participant received the interview guide via e-mail. A written explanation of our study purpose was given and participants were asked to read and reflect on the interview protocol questions. Permission for audio recording the interviews was given by all participants, by signing a consent form. Research approval was also granted by the ethical committee at the interviewer's University.

Aligning with previous investigation in mental toughness<sup>(6)</sup>, the "experience" corollary of Kelly's<sup>(19)</sup> personal construct psychology (PCP) theory was used for the elaboration of the interview guide. The inclusion of participants covering various levels of achievement was meant to gather different experiences and thus a more holistic and diverse understanding of the subject being studied.

The interview guide aimed to collect the participants' perceptions about mentally demanding situations in judo (e.g., thinking about those situations that require mental toughness from the athlete, and saying why they consider them demanding), taking into account their understanding about mental toughness in the sport (e.g., what does

it mean, in practical terms, to be a mentally tough judoka?). As notes were taken by the interviewer, follow-up questions were addressed when needed during each interview. Those included clarification probes (e.g., in other words, what does that mean for you?) as well as elaboration probes (e.g., do you remember any other kind of situation?). Few counterfactual questions were addressed. Interviewees were encouraged to share their opinions through the interviewer's short verbal and non-verbal cues.

Whenever possible, the interviews were carried out at the athletes' training sites or in the workplaces of the coaches. In some other cases, participants chose public places to conduct the interviews. All interviews began by collecting demographic and sporting data of the participant. The main author and interviewer maintained a neutral stance throughout all interviews, questing for elaboration without influencing the participants' opinions. Interviews were conducted in Portuguese (that is, the native language of all participants) and took 70 minutes in average. Digital audio recordings were transcribed *verbatim*, resulting in a total of 310 pages (single-spaced and with one inch margins) of typed transcript.

#### DATA ANALYSIS

Three of the research team members individually read and listened to each of the interviews' transcripts and respective audio records, in order to be familiar with all the data and get a first impression of its meaning. In order to manage and categorize the vast data collected, qualitative research software NVivo11 was used. The "experience" corollary of Kelly's<sup>(19)</sup> PCP theory contributed to the raw data obtained, as interviewees very often described situations demanding mental toughness in relation to their own experiences in the sport. All text segments identified in raw data were coded through "open coding", uncovering and delimitating concepts<sup>(4, 5)</sup>. Inductive content analysis was the research technique used by the investigation team, so that categories naturally arose based upon raw data. Each category's "properties and dimensions" were developed according to Corbin and Strauss's<sup>(5)</sup> main methodological aspects. Resulting categories were mutually exclusive, not overlapping each other, based on consistent definitions, differences between categories and multiple reviews. Inferences resulted in a conceptual framework of mentally demanding situations in competitive judo.

The main author had been himself a judo competitor during 14 years, practising the sport for almost 27 years. The fact that the interviewer was known in the sport community helped him get a good *rapport* among the interviewees. The informal atmosphere assured an honest conversation with every single participant. Moreover, trustworthiness during data analysis was also assured, due to the sport's knowledge detained by the first author.

The main author firstly assured the coding process, making inferences. Afterwards, investigator triangulation<sup>(22)</sup> assured trustworthiness of the coding process and the inductive analyses, by involving two more members of the investigation team experi-

enced in qualitative researches. When inconsistencies among the three investigators could not be settled unanimously, the first author's familiarity with the sport and its competitive subcultural domain was valued.

**RESULTS**

Discriminated results from the 966 coded text segments are presented in Figure 1, presenting frequencies for the number of athletes and coaches who pointed out each situation, in which it is critical to exhibit mental toughness in judo. Interestingly, 17 out of all 25 situations identified were reported by a total of seven or more participants. Considering all 20 situations identified by athletes, half of those comprised competitors from all three level groups. Coaches reported 24 situations, being that 18 of them were referred to by participants of all three levels of achievement. For every single bellow conceptualized situation presented in descendant order of frequency, we underline the reasons why those are seen as demanding, according to the participants' accounts. Each participant is simply identified as coach or athlete to remain anonymous. The resulting framework from this research is presented in Figure 2, at the end of this section, organizing mentally demanding situations in competitive judo, in relation to four supra-categories (i.e., non-sport context, training, competition and judo fight).

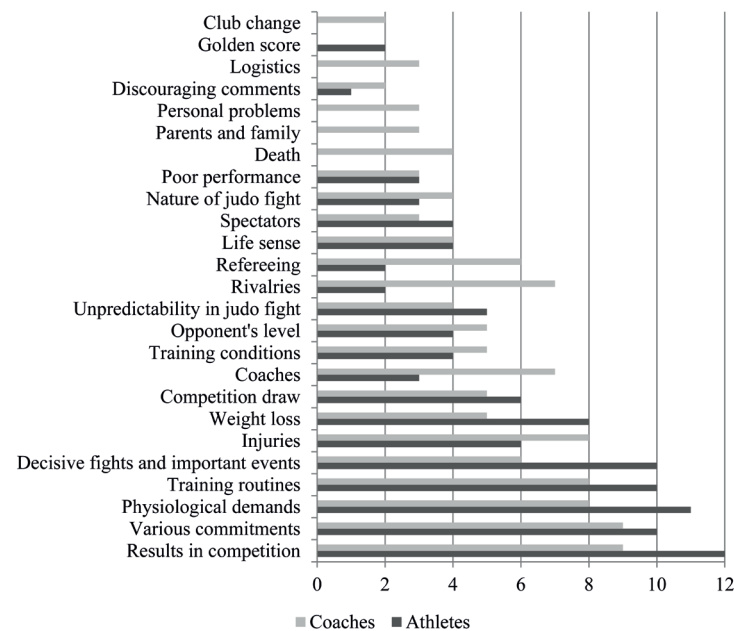


FIGURE 1. Coaches' and athletes' frequencies for situations requiring mental toughness in competitive judo.

RESULTS IN COMPETITION. The high level of requirement was perceived in relation to the need or imposition of achieving pre-defined and challenging competitive results and in having to manage the result during the fight itself. One sub-elite athlete was very clear in explaining the demanding essence of this situation:

... an athlete who wants to be very successful, to be part of the national team, to compete at an international level and to achieve results, has a certain concern about achieving results, because it is not just training at a high level and doing a lot of intense trainings. It is also necessary to have results, materialize what he has trained. ... avoid worrying about having to score [in the competition] and not letting it affect one's performance.

Negative results may have consequences for an athlete's sport career, making him miss training and competition opportunities at a higher level. In that sense, defeat or failure is a devastating result as was described by a sub-elite coach: "In competition, when one works a whole year or several years and then is faced with failure, it is a very huge setback. And this is a very big demand. Training always demands me effort either to succeed or to fail." In fact, an athlete has no guarantees about the outcome. His only guarantee is a great amount of demand and effort, whether losing or winning. In this context, two particular dimensions of this category were related to a final result during or after a competition: (a) to lose a fight and enter the repechage, losing the opportunity to achieve the competition's final, but still having the chance of obtaining a third place medal; (b) not obtaining a certain final classification in a decisive competition of the season and thus compromising one's long term goals. Three other dimensions of this situation were strictly attached to the result during the fight itself: (a) having to deal with an early score disadvantage; (b) having to make a turnaround in the final seconds; (c) maintaining the score advantage in the last seconds of a bout, despite the opponents' pressure.

VARIOUS COMMITMENTS. To conciliate competitive judo with life's various commitments means having to set a balance, on one side, between school or academic education, peer pressure, hobbies, family events, love relationships and, on the other side, the tasks and time that judo demands from athletes. That is, in order for life's various commitments do not interfere negatively with sport duties. In this sense, school requirements, for example, may withdraw energies and interfere in the physical and psychological state of the athlete when training, thus being very demanding. Bearing in mind the balance between judo and school or academic commitments, a non-elite coach presented a surprising example of an athlete who, in the midst of two competitions in Eastern Europe, had to give up on a judo training camp to return to Portugal and take an exam at University, while still being able to surpass internal rivals in the ranking and managing to be classified for the European championship, due to good results in both competitions. Nevertheless, from a certain level

of competition (i.e., European and world championships and Olympic Games), the athlete has to be totally committed to judo. In relation only to commitments within judo, one account stood out in the athletes' elite group, stressing the balance between national and international competitions, in the path towards Olympic qualification.

**PHYSIOLOGICAL DEMANDS.** Another situation largely reported by athletes and coaches through all levels of achievement was the physiological demand of the sport. When judokas prepare themselves to conquer European, world or Olympic titles, training is no longer intended to be something from which athletes draw pleasure from. There is nothing enjoyable about pushing your body to its physiological limits. It is, however, an inevitable part of the preparation for high level competition. According to a non-elite coach, "there is a discomfort that is impossible to overcome." To the extent that, even though an athlete is highly trained, discomfort, one way or another, will always be present. Overcoming extreme fatigue, in particular, is so important that coaches deliberately make their athletes go through such experiences during training (e.g., limiting the athletes' rest time during exercises).

**TRAINING ROUTINES.** Strictly complying with day-to-day training routines was seen as highly demanding for an athlete. In this situation, the mental challenge resulted from the daily rigor of an athlete's preparation, from monotonous and repetitive training exercises combined with high volume as well as the so-called "invisible training", in the words of a sub-elite coach, going beyond training itself. Therefore, it included rigorous sleep schedules, quality nutrition and a social lifestyle compatible with high performance. From the athletes' point of view, daily routines became harder to sustain when combined with critical events, such as accumulated fatigue, rehabilitation of an injury or poor performance on a bad training day. Among the elite, different accounts were added highlighting prolonged training camps completed abroad and at a higher level as a mentally defying situation. Indeed, from the coaches' viewpoint in particular, being in a sports hall where you train against the best judokas in the world, stood out as being mentally challenging. As such, to acknowledge the fact that there is a large gap between an athlete's own level and the average level in a training camp and, despite that fact, still endure being dominated, strangled, forced to submit and tossed on the floor by everyone, was understood as requiring mental toughness. Furthermore, high-level competition completely absorbs the athlete until the end of his career, with no possibilities for long breaks or distractions. Not even during vacations can the athlete totally turn off from training routines.

**DECISIVE FIGHTS AND IMPORTANT EVENTS.** The level of requirement in this situation was related to the pressure of difficult bouts held at major competitions (e.g., competing at the Olympics), since athletes are contending for personal relevant results in a valued competition and may face failure of their result goals. A sub-elite coach and former Olympic athlete explained it very well:

Even the progression throughout the competition requires psychological preparation, because you are advancing [in the competition] and you reach a certain point: Well, now I will enter the stage of winning or not a medal or winning the competition or not. And that's a different fight from the ones in the preliminaries. And these are situations that are more psychologically demanding.

This sense of pressure is felt through all the pre-competition moments, until the first fight.

**INJURIES.** Having the drive to train and not being able to do so is a major frustration for any competitor, whether it is an injury of lesser or greater severity. In fact, being injured gives athletes a sense of lack of control over their preparation, even more when it means for instance going under surgery and compromising the entire season. Losing the opportunity to compete at a major tournament, due to an injury, can be devastating for an athlete, as was explained by an elite coach:

This right (competing for a result, for a medal) is denied by an injury to someone who worked so hard. That's really demanding. And once again going through lengthy periods of training, coming back to that level again to be able to fight for this medal, when we talk about the Olympic Games, takes four years.

Thus, as the established goals are put on hold, this situation confronts the athlete with more than a delay in his scheduled preparation. Indeed, it is a regression to past levels of physiological and sport-specific preparation, as if a reset button has been pressed against the athlete's will, which in the case of severe injuries demands for a new start almost from scratch. In addition, this circumstance also included having to get along with minor injuries which are somehow chronic and therefore accompany the athlete almost constantly (e.g., poorly healed sprains in the fingers, requiring training and competing with adhesive tape). Interestingly, six out of 12 athletes indicated injuries as demanding, while eight out of nine interviewed coaches made reference to this situation.

**WEIGHT LOSS.** Not infrequently, when judokas are far from scheduled competitions they are heavier. As a competition approaches, weight loss is done in order to attain an unusually lower weight, comparatively to that usually registered during normal training periods. The intention of this behavior is to obtain a competitive advantage.

However, having to go through water deprivation and nutritional and energy restriction, resulting in an abrupt decrease of body weight, was seen as a mentally defying situation. Additionally, the demand is greater when the recovery time between the official weigh-in and the first fight in competition is shorter depending also on the relative percentage of weight lost. In the athletes' elite group a more in-depth vision was given about this tough reality:

Weight loss is a phenomenon that is still a bit taboo, because it goes against all the medical indications and all the scientific knowledge that we have mastered over physiology of hydration and caloric restriction. But the truth is that athletes continue to lose excess weight to compete. And I have an opinion which is: If they do it, it's because it works.

Concerning the restrictive physiological nature of losing weight to compete, one sub-elite coach reported a relevant episode of when he was an elite athlete:

The loss of weight due to the physical wear out that it causes you and pain; And the fact that you have to give up eating and drinking water. That has influence, to begin with, on the physical part and, in turn, the psychological part ... I remember doing [university] tests and not being able to drink water.

Moreover, as a non-elite coach stressed, "drinking and eating is above all things ... is what makes us living beings." All together it becomes a demanding process both mentally and physically.

COMPETITION DRAW. Any draw for a competition is unpredictable in its nature. It can be known in the day of the event or at best, if considering an international scene, a few days or in the day before competing. On the other hand, an athlete can have the luck of confronting approachable opponents in the first fights, progressing well or with less difficulty and lower energy expenditure to later stages of competition. Contrary to that, a more challenging adversary in the first fight may immediately dictate the end of a participation in a competition. Thus, the draws are not all equally difficult, such as it became clear in the words of a female sub-elite athlete: "If we want to be the best, we have to win them all. But there are always more favourable draws than others."

COACHES. This situation arises in the context of the relationship between athlete and judo coaches. Besides high demands exerted by coaches, both the lack of communication and the inadequate articulation of the work done by different coaches (i.e., national team, club, physical trainer) or other practitioners (e.g., physician, physiotherapist, nutritionist, sport psychologist) were underlined as a circumstance mentally defying for the athlete. Thus, instructional feedback provided by coaches was seen to pose demand, especially, when requiring the athlete to overcome technical or tactical incompetence. Participants also revealed

the possibility of the coach inadvertently putting pressure on his athletes' performance, due to feedbacks making explicit mention to rivals' strong points. Furthermore, to have a coach with whom the athlete is unable to talk openly with also emerged in our sample, in so far as it does not allow for the resolution of the athletes' most sensitive problems, which might be something that coaches may not be able to do, either because of inability or because of tension in the coach-athlete relationship. In addition, one particular account of an elite athlete stressed the case of when the coach is simultaneously the father. Moreover, a sub-elite coach perceived demand when an athlete feels unfairly left out of a call to the national team. Interestingly, references to this situation were higher among coaches than in athletes.

TRAINING CONDITIONS. This circumstance was particularly highlighted by athletes as demanding due to disadvantages within one's training group, namely, when training partners offered lower levels of opposition in fighting, lacked serious competitive objectives or presented body mass far from their own weight category. One female sub-elite athlete gives an explanation about the practical implications that these difficulties might pose on competitive judokas:

More often than ever we do not have in our club, or near us, the ideal conditions to train and keep ourselves at the highest level ... living in Coimbra, sometimes I go to Lisbon by train ... not everybody does this, do they? Leave my classes running, go catch the bus, travel on the bus for two hours, call the coach to pick me up, train and return to Coimbra on the same day.

For someone who lives in Coimbra, a round trip to Lisbon means travelling a total of approximately 400 km. Thus, the shortage of a wide diversity of training partners generates difficulties in an athlete's preparation process and consequently in his progression in the sport. Another sub-elite athlete gave us yet another relevant example of those difficulties: "I, who live on an Island, do not have as much variety of partners to practice with, than if I lived in the Continent."

OPPONENT'S LEVEL. Demand was pointed out regarding confrontation against superior adversaries, whether on the level of competitive performance, experience in the sport or personal records or titles. Athletes mentally weaker may tend to appraise demand for a fight based on how renowned the opponent is, instead of focusing on what can be done. A mentally tough judoka, however, does not let himself be shaken by notorious or higher ranked opponents. Mentally tough judokas will act regardless of those considerations, as pointed out by one elite athlete: "He was able to abstract himself from his adversary, from his adversary's curriculum, from his opponent's level." In a clear contrast to the mindset here portrayed by a non-elite judoka: "I am not able to beat this opponent, because he has many titles." Interestingly, confrontation against lower-level opponents was also perceived as being susceptible to trigger demand, in so far as it would raise the pressure to defeat them.

UNPREDICTABILITY IN JUDO FIGHT. This situation was considered demanding, because one split-second distraction or a single bad decision can represent the end of a bout or even of a participation in a competition. A female sub-elite athlete explained well the nature of this circumstance well: "I felt that I could win. I was winning. And it was a one second distraction, she pulled a rabbit out of her hat and I went through the air." In judo a single mistake can be fatal, even after a faultless performance, in contrast to other sports in which, after one or several mistakes have been committed, there is still a possibility to recover from the game result and end up winning.

RIVALRIES. In judo, rivals are those competitors, belonging to the same club or not, who fight each other in the same weight category and are in dispute for the same result goals or, for instance, who are competing during Olympic qualification for a single quota place in the Olympic Games, as described by one elite athlete:

The situation that I have lived for a long time: not being at the top and wanting to be at the top ... I remember many people calling me crazy. For example, for four years [a rival name] was the number one at the weight category; for four years I was number two and worked as much or more than him, because I wanted to get there...

The only two athletes who reported this situation were both elite. Interestingly, among coaches a higher prevalence was ascertained, as seven coaches from all three levels made reference to the demand of rivalries.

REFEREEING. Staying focused and emotionally unmoved after a bad referee call is the quality of the psychologically stronger competitors. This particular situation was reported as a mentally demanding circumstance by one non-elite and one elite judoka. However, demand of refereeing was taken very seriously by six out of nine interviewed coaches. To the extent that some of them would simulate refereeing mistakes in training, without previous information, so that they could test the athletes and, thus, alert them to the importance of keeping their focus on what matters the most during a fight. One non-elite coach, but former Olympic athlete analyses it in the following terms:

This situation requires the athlete to accept something that is unreasonable: We are stronger; we have already proved, that we are stronger, but we will have to prove that we are stronger again, so that external factors will not take the victory away from us.

LIFE SENSE. Demand was perceived due to the fact that an athlete's career is short and the post-career requires for a dramatic change in lifestyle, for which an athlete must prepare himself for. This was well described by one recently retired elite athlete: "Also the pressure of you to think that this is all very beautiful in judo, but then what? How am I going

to support myself? What will I do? Will it be after the age of thirty?" From the coaches' standpoint, life sense was about deciding to place the sport in the center of one's life. A paradigmatic example given was being to temporarily suspend a higher education course to pursue competitive aspirations, like for instance an Olympic qualification. Indeed, investing in a sports career has its degree of uncertainty, as athletic success is not guaranteed, and it will entail, from a certain competitive level, an inevitable delay in many aspects of an athlete's life in society (e.g., course completion; entry in the world of work; planning a family). Moreover, it is not only a difficult and risky decision, but also a choice that has to be made at a young age, said a non-elite coach and former Olympic athlete:

These are very difficult options that one has to take at a very early age. Therefore, at sixteen or fifteen is when one decides whether one wants to or not. Because then, at the age of twenty, it's too late. The opportunity has already gone. Time has passed. It's no use to be an athlete at twenty-five: Now I've completed my degree and now I'm going to be an athlete. No. It's over, that's it. His time is over.

SPECTATORS. The pressure that spectators can put during the fight, either in support of the opponent or to pressure the refereeing, was another demanding situation reported by a few of our judokas. One elite athlete captured this reality, while narrating how a known national rival typically laid out his fight strategy against him: "Then that fight turned out to be an open-air battle... because the refereeing was allowing the situation and him [the opponent] was exploiting the situation with his colleagues shouting from the bench, pressuring the referee." In addition, some athletes may not react well to the fact that they have important people or, as explained by a sub-elite coach, a big audience watching their matches: "In this case, I feel it's more the psychological part that shakes you... Imagine a sports hall like Paris Bercy... completely full. And you know how to manage: Where am I? What is this? Everyone shouting..."

NATURE OF JUDO FIGHT. Judo is a one-on-one combat sport which requires for the competitor to perform, despite the intense physical contact and impact forces over the mat-covered floor allowed by the refereeing rules and caused by the different techniques that typify judo (i.e., projections, holding against the mat, opponent submission either by strangling or attempt of joint dislocation applied to the elbow). Thus, bruises or burns due to friction, for example, and also strong impacts on the body are a natural part of a combat sport such as judo. Some sportsmen however may not perceive those as normal and manageable circumstances, in contrast to the description given by a non-elite coach, regarding high-level competitors: "There is no athlete who is one hundred percent, without injuries. They all have a nail or a finger or a half-hurt knee or a hurt shoulder, neck..." Interestingly, the only three athletes reporting this mentally demanding situation, as well as the four coaches, comprised all the levels of achievement.

POOR PERFORMANCE. Interestingly, exhibiting a poor performance during training sessions was a mentally demanding situation only reported by female athletes, each one belonging to a different level of achievement. Coaches mentioned this situation in relation to performance in competition.

DEATH. This situation was explained in relation to the death of a relative or a loved one. Curiously, it was not reported by any athlete. A sub-elite coach stressed how hard this is:

If it is a family member who is very dear and who is the major supporter of his activity as a judo player, I think sometimes this is difficult. I do not think so. I am sure of it. It is very difficult in these concrete cases, a loss of the father or mother...

PARENTS AND FAMILY. This situation refers to the case of parents who criticize poor competitive results and, at the same time, demand results from their child athletes. Instead of parents or family members giving their children an upbeat and encouraging climate through what they do and say, they end up being a source of pressure on athletes. In addition, education and values transmitted within the family may be counterproductive to the desirable mentality of a competitor. This undesirable intervention by the family, only mentioned by coaches and curiously comprising all three levels of achievement, was well exemplified by one sub-elite coach:

'You have lost, they are stronger than you. Poor little thing.' He is the poor thing: 'Patience. You are not good for this.' Sometimes we see that the athlete has abnormal motor abilities for that sport, but it has a psychic part that would have to be better worked on. And with the optimal family environment, he would be able to make the leap forward.

PERSONAL PROBLEMS. This included extra-judo problems, only mentioned by coaches, related to the competitor's personal life, which may interfere with the athlete's sport performance, such as, for instance, separation of the athlete's Parents or the end of a love relationship. An elite coach illustrated how such circumstances are reflected in training:

Problems outside of judo in which the athlete appears sad to me and is no longer himself; anyone realizes right away it's not him. And the coach soon realizes that. A young man who has been with you since the age of seven, you soon see that it is not him, as he appears very sad.

DISCOURAGING COMMENTS. It occurs when someone communicates unfavourable comments or discouraging opinions to the athlete, contrary to the athlete's own goals. An elite athlete gave an example of this: "... it may be a person coming to me and saying that I will not qualify for the Olympics. ... I can stay connected to that or in the next competition achieve second place, just like that."

LOGISTICS. A sub-elite coach explained the essential of the demand attached to this situation, concerning travel to sporting events:

When we start going abroad, the trips we have to make and the issues that have to do with the time zone, different foods, different routines, different hotels. All of these are difficult things. Nobody can say that an athlete, at that time, really likes to take a stroll. No one is going to stroll: it is airports, hotels, sports halls. This is the life of the athletes.

Moreover, an elite coach explained the demand of this situation with the example of a delay in the arrival time of an airplane, which reduces the athlete's number of rest hours. Athletes made no reference to this circumstance.

GOLDEN SCORE. The duration of contest in judo at Olympic level is of 4 minutes. When the regular time allotted for a fight comes to an end without a winner being decided, the match is extended, with no time limit, till one of the fighters either scores a technical advantage or receives a penalty that causes him to have more penalties than the opponent. This mentioned extra-time is called the golden score period and was presented in the reports of two athletes, one female and one male, as a psychological demanding situation, also enclosing a concomitant physical requirement, due to the onset of overall fatigue. This was the only situation the coaches did not make any reference to.

CLUB CHANGE. This situation occurs when the athlete is forced to change his place of residence, either because he moves to another city or even changes his residence to another country. In that context, it may be hard to leave the club and, at the same time, adapt to a new training location and to new people. Only two coaches reported this situation.



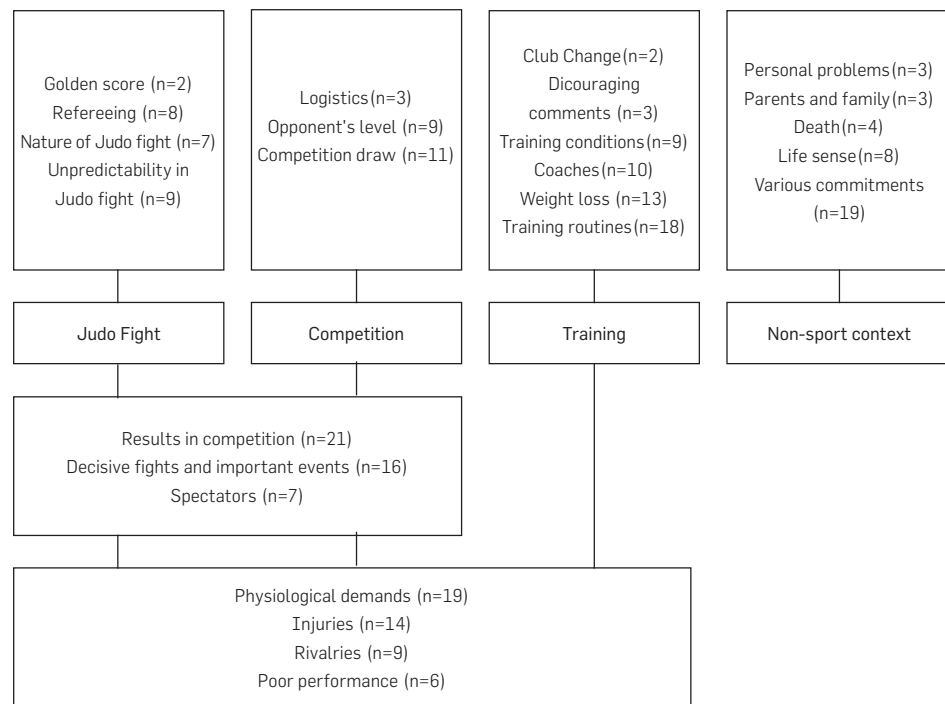


FIGURE 2. Framework of situations requiring mental toughness in competitive judo.

## DISCUSSION

The purpose of this research was to identify situations or circumstances, either within the context of competitive judo or outside the sport context, which are seen as requiring mental toughness from the athletes. Besides the knowledge about the psychological qualities that underpin mental toughness, it is also important to identify when (situations) mental toughness attributes should be put into practise, thus considering the nature of judo as a competitive sport. A few single-sport studies have explored these psychologically demanding situations <sup>(13, 26)</sup>.

If we consider that the essence of elite competition lies in achieving increasingly more relevant results in important tournaments, we understand why having to deal with results (i.e., during the fight and during or after a competition) was the only mentally demanding situation reported by all athletes and coaches of our study. Moreover, "perception of failure" was already identified amongst the most rated reasons for attrition in sport participation of Spanish sportsmen, judokas included <sup>(21)</sup>, thus constituting an evidence which reinforces our finding.

"Having other things to do" was the number one reason for dropping out already identified in previous research in youth sport <sup>(21)</sup>. In line with our results, these authors also emphasized the need for conciliation between competitive sport and "non-sport influences" such as school, professional and family commitments, which clearly go beyond the sport sphere, but nevertheless constitute a major problem for continued sport participation, even more when considering a largely amateur sport. Furthermore, Gucciardi et al. <sup>(13)</sup> highlighted "balancing commitments" as well as "peer and social pressure" within the mentally challenging situations of Australian Football, thus reinforcing our situation conceptualized in judo as various commitments. Curiously, both situations, conceptualized within judo's various commitments category, were identified in Australian soccer as requiring mental toughness <sup>(6)</sup>.

According to Franchini, Del Vecchio, Matsushigue, and Artioli <sup>(11)</sup>, judo is a complex sport due to its physiological and physical demands, including several variables of cardiorespiratory and muscular fitness. Thus, thrive through such physiological demands in high-level competition, more than a psychologically defying circumstance, is fundamental to success in competitive judo, just as it was reinforced in our results.

Our findings in reference to the demand of training routines reinforced those from Gucciardi et al. <sup>(13)</sup>, in which the authors signalled "preparation" as a situation which requires mental toughness in Australian football, also including beyond-training preparation (e.g., nutrition).

Dimension and importance of the tournament was previously identified as a source of competitive stress in a youth national Olympic team, where judo athletes were included <sup>(20)</sup>.

The broad knowledge about injuries and the risk of injury in judo, including chronic injuries <sup>(see 23)</sup>, helps in understanding why they have appeared in the results of our study as a psychologically demanding circumstance. Curiously, coaches in our sample were more prone to highlight demand for this situation, although with no apparent reason. The difference may be due to the effect of the sampling technique used. Moreover, this particular situation had already been identified in Australian football <sup>(13)</sup>.

Weight loss described in our study was in line with the sport's subcultural demands, which normalizes negative experiences related to the process of making weight to compete <sup>(see 24)</sup>. Moreover, Escobar-Molina, Rodríguez-Ruiz, Gutiérrez-García, and Franchini <sup>(10)</sup>, had already recommended the implementation by sport governing bodies of rules to sanction unsafe practices of weight loss. This emerged as a demanding situation peculiar to judo, along with unpredictability and nature of judo fight and matches decided on golden score. Among these last mentioned four situations, all except golden score, but especially rapid weight loss may be shared nonetheless with other combat sports. In the case of unpredictability of the sport, it slightly diverges from the analysis of Weinberg et al. <sup>(28)</sup>, in the sense that failure in a judo competition may be irreversible. Thus, not an experience one can cope with and then "come back later that day".

Not surprisingly the coach-athlete relationship was predominantly reported by coaches in our sample as a potentially tough circumstance. That finding was in a sense consistent, for instance, with previous conclusions in Australian football, describing coaches as either facilitators or hindering agents in the development of mental toughness <sup>(15)</sup>. Thus, the absence of both positive coach-athlete relationships and the lack of an open communication were, not surprisingly, found to be a mental toughness demanding situation in judo, while in Australian football their positive poles were aspects considered relevant for the development of mental toughness. Moreover, "dislike of the coach" was the second most rated reason for attrition, ultimately resulting in sport dropout, within youth Spanish athletes, including judokas <sup>(21)</sup>. Interestingly, in elite French female judokas, "where winning is essential", national team coaches' authoritarian interaction style broke with conventional literature on sports psychology, and, although effective, athletes did not appreciate it <sup>(6)</sup>. However, as these authors discussed, the French judo system benefited from a large base of athletes' recruitment which allowed them to perpetuate excellence by imposing autocratic climates and, thus, mentally tough circumstances simultaneously incompatible with self-determination needs of the athletes. Contrariwise, considering the coach as an important social support provider, a good coach-athlete relationship was deemed important in youth Norwegian sportsmen, judokas included, so as to achieve a good performance and an enjoyable experience in competition <sup>(20)</sup>.

Practice environment has been previously identified by coaches from various sports as a strategy used to develop mental toughness <sup>(27)</sup>, somehow explaining how disadvantageous training conditions in judo were seen as a challenging experience.

Psychological demand emerged in general due to negative or adverse situations for the judoka. Yet, in regard to the opponent's level as a mentally demanding situation, a curious reference was made to when confronting a lower level competitor. Our finding thus gives a small support to the understanding of Gucciardi et al. <sup>(13)</sup> by which the authors distance mental toughness from other constructs (i.e., hardiness and resilience), since it also proves to be important under favourable or positive circumstances.

Rivalries as a mental demanding situation were predominantly reported by coaches of all levels and two elite competitors, in our research. Interestingly, "stimulating interpersonal rivalry between athletes" was previously described as an interaction strategy used by expert French judo coaches within national female team, in order to foster internal competition and judokas' motivation to progress constantly and never settle while at the top <sup>(6)</sup>. Thus, our results suggested that this is a psychologically demanding reality particular for elite competitors. Findings on elite female Gymnasts also support such conclusion, curiously adding rivalries with siblings <sup>(25)</sup>.

Among competitive situations out of the individual's control which require mental toughness in Australian football, "umpiring decisions" and "crowd" were identified <sup>(13)</sup>, thus reinforcing our findings on both refereeing and spectators.

In the context of the Portuguese judo community, an athlete is required to decide on his life path, assuming or not to plunge into a life as a sport competitor. To go for a competitive sport was seen as an all-or-nothing life decision, due to the mainly non-professional nature of the sport in the country and the low social recognition. Along these lines, very few judokas in the country thrived in achieving high-level results. Statistics for Portugal in judo are clear, indicating two Olympic bronze medal winners and nine world championships medals distributed among five competitors, with a female athlete owning five of those nine medals.

Having a bad training day was seen as mentally demanding in our study and conceptualized under the label of poor performance. This experience was consistent with the results in elite swimming, according to which "retaining psychological control on poor training days" was a subcomponent of being mentally tough, thus implying demand on this circumstance <sup>(9)</sup>.

Family is amongst the social support providers <sup>(20)</sup>. Parents and family raised the psychological demand, as suggested by our results, by creating a mentally demanding surrounding, due to lack of emotional, tangible and informational support. In elite female gymnastics, parents and family were seen as influencing the development of mental toughness <sup>(25)</sup>.

In soccer, "being criticised" was a situation intended to require mental toughness <sup>(3)</sup>, which we can lightly relate to the discouraging comments situation found in our study, insofar as criticism may not serve as an encouragement.

Somehow in line with logistic demands described in our study, organizational stressors in competition, including transport and food-related ones, have already been highlighted in literature <sup>(see 20)</sup>, which lends evidence to logistics as a mentally demanding situation.

## FINAL CONSIDERATIONS

To our knowledge, this was the first research investigating perceptions of situations in judo which require mental toughness from competitors. Collecting data from athletes and coaches with different levels of achievement, presuming that different experiences will result in distinct and complementary knowledges, gave us distinct viewpoints about the vast reality that is competitive judo, from its purely amateur roots to the elite Portuguese community. Focusing our study at exploring sport-specific situations, allowed us to gather a more in-depth, detailed and concrete understanding of the challenging nature that competitive judo poses on athletes and, ultimately, to better understand why mental toughness becomes vital to achieve success in this sport.

Enduring and thriving through environmental demands typical in judo is of paramount importance to achieve competitive excellence. In this sense, the mentally demanding situations identified in the present study should be addressed in practice together by coaches and sport psychologists. Judo coaches' practices will benefit from the acknowledgment of men-

tally demanding situations, diagnosing more easily, during training, competition and in non-sport involvement, who is mentally tough and who needs to improve. Our findings will assist sport psychologists in their applied work by presenting them particular knowledge of the sport and thereby, in line with Crust <sup>(7)</sup>, of the competitors' specific needs in competitive judo.

The knowledge acquired in this study can be a starting point for further research on the subject, clarifying, as previously suggested <sup>(see 18)</sup>, which of the psychologically demanding situations in judo are prone to nurture mental toughness and, on the contrary, which of them are mentally challenging and more detrimental than beneficial, in developing qualities of a mentally tough judo competitor. For instance, one of the Olympic athletes interviewed confided us that constant weight loss would have been one of the most important explanations for having abandoned his sports career earlier than desirable. This line of inquiry may also assist in further understanding the role of mental toughness attributes, as already suggested by Gucciardi et al. <sup>(13)</sup>, distinguishing the most common and relevant of these qualities in competitive judo.

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