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The Relationship between Psychological Factors and Performance Level in Female Football

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Preface

I would like to thank my supervisors, Sigurd Pedersen, and Susann Dahl Pettersen, for their valuable advice, and their desire for this thesis to be the best it could be, which has been as motivating as it has been helpful. Additionally, I want to thank my father for his contributions through discussions and insightful inputs. Finally, I would like to thank the Female Football Research Center for granting me access to their data to use in this study.

1 Abstract

The purpose of this study was to see if there were significant differences in female football players' psychological factors across performance levels. We also investigated whether the same differences could predict at what level female football players compete.

Method: The study involved a sample of 188 female football players across three performance levels. Data were collected by five questionnaires, each related to one of the following psychological variables Motivation, Grit, Mental Toughness, Perceived Mastery Climate, and Self-regulation.

Results: Results from a Kruskal-Wallis one-way ANOVA showed significant differences between performance levels in mastery climate, amotivation, evaluation, and external regulation. There were no significant differences between grit or mental toughness and performance levels.

Discussion: These findings suggest that there are differences in scores of psychological factors between levels, although high levels of these psychological factors do not necessarily correspond with higher performance levels.

2 Introduction

Football is played worldwide by people of different sex, ethnicity, and ages. Even though football has been a hot topic in research over the last decades, women's football has been out of favor compared to men's and needs to catch up, as only 15% of studies on professional football players examine female athletes (Kirkendall & Krstrup, 2022). However, the field of professional female football is on the rise as the number of studies has increased more than ever in the last ten years (Kirkendall & Krstrup, 2022). In football, players on the same team require different physical, tactical, and technical attributes to perform based on their positions on the field (Hoff & Helgerud, 2004). Further, football may require players to possess certain psychological traits to optimize these skills in training and competitions. Psychology has been postulated as an under-researched topic in football (Kirkendall & Krstrup, 2022; Pettersen et al., 2021). Nevertheless, recent research investigating psychological factors in combination with match performance is shedding light on the complex interplay between physical, technical, and psychological attributes in football (Pettersen et al., 2023), providing more insight into this topic. In a survey of football coaches questioning what they want from the sports science field, the most wanted area of interest to learn more about was “mental skills”, demonstrating considerable interest in the practice field (Brink et al., 2018).

Psychological traits could relate to sporting success, and a comprehensive review by Allen et al., (2013) found athletes to score higher on extraversion and lower on conscientiousness than non-athletes, suggesting these traits to be related to athletes' long-term success. Further, another review exploring football players' future performance demonstrated minor effects of psychological factors on performance outcomes (Ivarsson et al., 2020), making the picture more unclear. The few studies conducted on female football players show a trend that athletes who play at a higher level score better on certain psychological factors (Pettersen et al., 2021). Sports psychology is a field that should be further investigated by researching mental skills to see whether they impact performance in female football. In turn. This can lead to evidence-based recommendations for the practitioners and key stakeholders, eventually leading to better practice.

Psychological attributes are understood to influence players in match settings, which could make mental toughness (MT) relevant for improving their performances. For example, in a study by Williams et al. (2020) MT was important for female footballers in South Africa

as it positively affected stress and anxiety and improved their motivation and self-esteem. Moreover, a systematic review by Pettersen et al. (2021) explored former studies on the influence of psychological factors on performance in female football. The review found 14 relevant studies, and the results showed that athletes performing at the elite levels scored higher on MT than those at a lower level which may indicate it could be a predictor for performance. The study also found mastery climate and enjoyment relating to increased performance and perceived competence. On the other side, a study by Nicholls et al. (2009) found that MT did not predict performance. The same study found men to score higher on MT than women, which makes it interesting to investigate whether female football players who score higher on MT perform on a higher level than those with lower scores. A recent study by Pettersen et al. (2023) found perceived mastery climate to predict the individual performance of female footballers in Norway. The same study explored grit, MT, and self-regulated learning and made no significant findings on these variables. As the results in these studies are somewhat contradictive, it should be further explored whether these factors are important for female football players to enhance their training and performances.

The following section will introduce two theories that investigate the factors that may impact athletes' development.

Self-determination theory

The self-determination theory (SDT) was developed by Deci and Ryan in 1985 (Deci & Ryan, 2013). The SDT explains the motivational factors that drive an athlete to participate in their sport. The theory argues that athletes who feel competence, autonomy, and relatedness to the sport they practice are more motivated than those who do not. This implies that athletes who are more in control of their training and competition and feel connected to their teammates and coaches will be more engaged and motivated in their sport. The theory can also help to identify factors that may lead to burnout and lack of motivation for athletes. When athletes are pressured into participating in a sport, or when their autonomy is constrained, they may be less likely to find the sport enjoyable, leading to a lack of motivation and possible burnout. SDT also highlights the importance of providing autonomy support to athletes, which means providing the necessary resources and opportunities while also allowing athletes to make their own choices, take control of their processes, and set their own goals, which increases the athletes' motivation and engagement.

The theory can also be used to evaluate the effectiveness of different types of interventions,

such as mental skills training, that are designed to promote motivation, engagement, and performance in athletes. By understanding the psychological needs that underlie motivation and engagement, researchers can develop methods that are more likely to be effective in optimizing performance. Overall, SDT provides a sound theoretical framework for understanding athletes' motivational processes and can be used to guide research on how to promote optimal motivation and well-being among sports performers. It can also be used to evaluate the effectiveness of various interventions designed to enhance motivation, engagement, and performance in sports.

Achievement goal theory

According to Elliot (1999), the achievement goal theory (AGT) is a theoretical framework that originates from several works from the 80s (Ames, 1984; Dweck, 1986; Maehr, 1984; J. G. Nicholls, 1984). The AGT explains the differences in athletes' motivation by looking into what they want to achieve within their sport. Further, the AGT compares task-orientated and ego-orientated goals to see how the performance affects the athletes' motivation differently based on how they approached the competition. Ego-orientated goals are based on results or comparing of performance or abilities to others. Task-orientated goals are set to learn and improve new skills and are seen as a trigger for intrinsic motivations (Weinberg & Gould, 2019). The AGT examines the process of athletes' goal setting, pursuit, and evaluation. Whether an athlete sets ego- or task-orientated goals is likely to affect their performance, motivation, and resilience (Weinberg & Gould, 2019). The AGT suggests that being focused and striving towards a realistic, mastery-based goal that is individually adjusted to the athletes individually is the best way to improve their skills in the long run. By achieving their goals, the athletes make progress by mastering something they struggled with earlier. That in turn, could trigger their intrinsic motivation. Other relevant factors would also include how the goals are made and evaluated and what kind of motivational climate they work in. The social environment could be of importance to how athletes develop. Coaches, parents, and other people related to the activity could influence whether it becomes a negative or positive climate. The motivational climate is affected by how coaches and teachers facilitate tasks in a task- or ego-orientated manner. A study by Gershgoren et al. (2011) found that the feedback young athletes receive from coaches and parents influences how they portray the climate they belong to and become more task/ego-orientated when receiving task/ego-orientated feedback. Mastery climate is seen as the most appropriate as it has a

positive effect on achievement motivation and psychological factors such as reducing stress (Pensgaard & Roberts, 2000). This theory is relevant when comparing different levels in female football as it addresses which elements sustain and increase the drive of a person to complete a task.

Mental toughness

Since the beginning of the 2000s, MT has been widely explored to investigate how it impacts individuals' psychological factors. A study by Gucciardi (2017) looked at the different definitions of MT as it has been heavily debated how the subject should be defined. The definitions below show the complexity and broadness of the field that MT ranges from. First, MT was defined by Gucciardi et al. (2008) as follows: “Mental toughness is a collection of values, attitudes, behaviors, and emotions that enable you to persevere and overcome any obstacle, adversity, or pressure experienced, but also to maintain concentration and motivation when things are going well to consistently achieve your goals” (Gucciardi et al., 2008). The next definition by Clough & Strycharczyk (2012) offers a more straightforward and broader understanding of what MT is. “The quality which determines in large part how people deal effectively with challenge, stressors and pressure... irrespective of prevailing circumstances” (Clough & Strycharczyk, 2012). Furthermore, the most recent definition of the subject was made by Gucciardi (2017) and is based on how researchers in the past defined the term. «MT can be defined as a state-like psychological resource that is purposeful, flexible, and efficient in nature for the enactment and maintenance of goal-directed pursuits.» (Gucciardi, 2017).

Nicholls et al. (2009) studied the differences in MT over different competitive levels by using the mental toughness questionnaire. First, the study found male athletes' MT scores to be significantly higher than the females' scores, indicating gender differences. Secondly, the results also showed MT to correlate with age, suggesting that experience has a positive effect on MT. A study by Danielsen (2017) investigated the relationship between achievement level and MT in female football by comparing football players competing at the elite level, second level, and third level in Norway. The study compared the results from 298 Norwegian female football players using a sports mental toughness questionnaire. The results showed a significantly higher score on MT at the elite level compared to lower leagues. Kristjánssdóttir et al. (2019) found a similar effect between competitive levels when measuring the MT of 142 female football players in Iceland. The performance levels ranged from the 2nd level to the

Icelandic national team and the data was collected using the mental toughness questionnaire. The study revealed that national team players displayed higher levels of MT compared to players from the 1st and 2nd levels. Additionally, players from the 1st level exhibited higher MT scores than those playing at the 2nd level, indicating the potential relevance of MT as a performance predictor. These findings suggest that MT could be relevant for predicting the level that female footballers reach within female football.

Motivational climate

Motivational climate refers to what the players the players perceive the head coach emphasizes. An ego-oriented environment is described as focused on results and personal gain over achievement and development. In a task-orientated environment, athletes learn that working toward goals and solving tasks is the best way to succeed. The approach of the environment influences practitioners to perceive these traits as success criteria. Task-orientated climates are encouraged since it more often leads to a strong work ethic and persistence in the face of failure as the evaluation is not affected by the result (Weinberg & Gould, 2019). A recent study by Pettersen et al. (2023) found mastery climate to be a predictor of individual performance with a sample of 156 female football players across Norway's top two divisions. As mastery climate is not a psychological skill *per se*, but a perceived climate of how the athletes feel about the environment, it is suggested that coaches should be aware of how they influence and facilitate the group climate to make it more mastery-orientated rather than ego-orientated. This was also investigated by Alvarez et al. (2012) who researched coach-created motivational climate in football. This study looked at the motivational climate's impact on young male football players' intentions to continue with the sport. The study used the SDT and the AGT as the theoretical framework for the research to see whether the coach's behavior influenced the athletes' motivation to continue pursuing their sport. The results showed that task-orientated climates had a positive effect on the three psychological needs (autonomy, relatedness, and competence), and indicate that a task-mastery climate has a positive effect on young athletes' intrinsic motivation, which again positively affects their willingness to continue. This study is backed by Weiss et al. (2009) who found that players that value a mastery climate where the coach gives constructive and encouraging feedback have higher levels of perceived competence in football, greater enjoyment, and enhanced intrinsic motivation to continue playing the sport.

Motivation

Motivation is described by Sage (1977) as the direction and intensity to one's effort. Motivated individuals possess a strong sense of self-efficacy, a deep commitment to achieving their goals, and can sustain a high level of effort over an extended period (Pensgaard & Hollingen, 2006). The sports motivation scale (SMS) (Figure 1) by Pelletier et al. (1995) investigated where one's motivation to perform a task comes from by dividing the term "motivation" into subgroups, namely intrinsic or extrinsic motivation. Intrinsic motivation is described as the motivation created when one can engage in an activity of one's own free will due to the inherent joy or satisfaction achieved while doing the activity. This type of motivation is divided into three subgroups, knowledge, stimulation, and accomplishment, each considered essential in creating intrinsic motivation. Intrinsic motivation is referred to as the key to achieving progression, as the reason an individual wants to take part in an activity comes from the joy of performing the activity itself. Extrinsic motivation is seen as motivation from external factors and is divided into four subgroups. Integrated regulation is the most advanced form of extrinsic motivation, as the outcome is more important for the individual than the activity itself. "Identified regulation" is when a person values and accepts an activity, even if it does not give them pleasure, because they believe it positively affects them. "Introjected regulation," on the other hand, comes from external factors that influence a person's actions.

External regulation is triggered by gaining a reward or avoiding punishment. It is seen as the classic extrinsic motivation that comes entirely from external factors. Amotivation is the form of motivation when an act does not have any value for the one involved, and it feels pointless to participate or put in an effort toward the task. The types of extrinsic motivation not related to self-determination are associated with anxiety and could cause negative outcomes (Levesque et al., 2010).

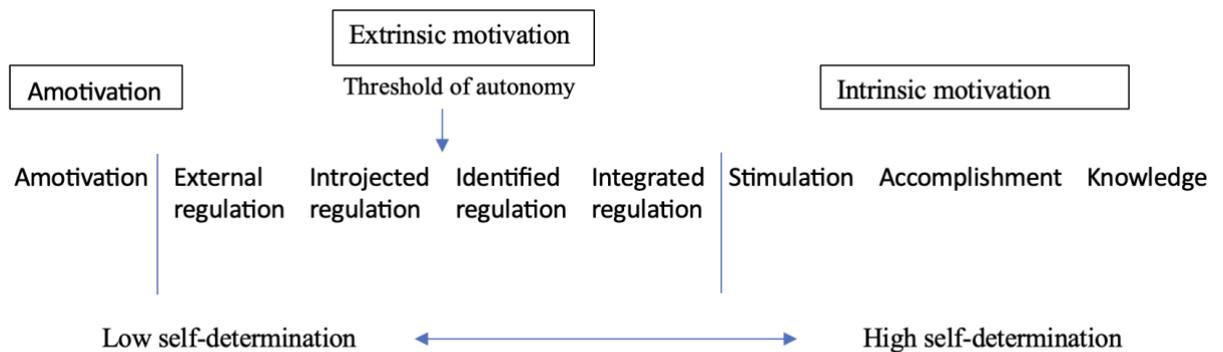
Intrinsic motivation plays a crucial role in the progression of athletes. Therefore, it is essential to explore how athletes attain and sustain intrinsic motivation in order to facilitate optimal conditions that can aid in their growth and development as athletes (Pensgaard & Hollingen, 2006; Weinberg & Gould, 2019). Intrinsically motivated people tend to strive more to achieve progression due to their desire for the task. A study by Mallett & Hanrahan (2004) on ten elite athletes found self-determined motivation, such as accomplishment and competence, to be key factors for the effort they put into the sport. Their desire to reach their

personal goals was to the extent that their lives revolved around how they could accomplish them.

Figure 1 *Sports Motivation Scale (SMS)*

Figure 1

Sports Motivation Scale (Pelletier, et al., 1995)



By having an autonomous approach coaches are more likely to increase their athletes' intrinsic motivation. A study by Vallerand (2007) looked at the effect an 18-month autonomy program had on swimmers. The findings showed that the athletes' perceived autonomy increased, and attendance at practice increased while the number of dropouts significantly decreased. Athletes who receive positive feedback during exercises are more likely to increase intrinsic motivation (Vallerand, 1983), which indicates that coaches can influence their athletes' intrinsic motivation by applauding when they master a task. Other methods for a coach to increase intrinsic motivation within their group could be varying practice drills so that not all training sessions are similar, and this will keep the athletes more concentrated and challenged. Letting athletes take part in planning the training sessions could increase their feeling of being in control and feel that their opinions matter. If a coach and athlete work together to set specific performance goals within a 6–8-week span, they can discuss the progression during the period and evaluate it after. Athletes' motivation is likely to increase as it gives the training sessions a greater purpose and creates good conditions for coaches to give them specific feedback (Weinberg & Gould, 2019). Although there is limited evidence in the literature that there is a direct link between motivation and performance in sports, we believe that it is highly relevant to examine the link between player levels and their scores on the various subscales of motivation.

Self-regulated learning

Self-regulated learning refers to the capability of an individual to monitor and control their thoughts, emotions, and actions in order to achieve their short- and long-term goals (Weinberg & Gould, 2019). A model by Kirschenbaum (1987) breaks up self-regulation into 5 different stages. The first step of self-regulation is problem identification which is the athletes' ability to identify what they need to improve, whether it is possible to change, and if it is something they want to work on. Step two is the athlete's desire to stay committed to their goals even if there are obstacles or their improvement is slower than expected. Execution is the third and most important step as it is the individual's own ability to evaluate and monitor themselves as well as having realistic expectations of what they want to achieve.

Environmental management is the athletes' reflection on whom they consider to have a good effect on their development both in a social and physical environment. Generalization is about being able to maintain their new abilities and use them in new settings. An example would be if football players who learn to manage stress in specific match situations could transfer and implement the same techniques in other areas in their everyday life. A study by Toering et al. (2012) found self-regulated learning to predict the performance level of youth male athletes. By measuring the athletes' levels of planning, evaluation, reflection, self-efficacy, and self-monitoring they found elite levels to score higher on reflection than national players. The findings indicate that elite athletes benefit from reflecting on how they perform and can adjust their actions in training or competition based on this.

Grit

Grit is described as the passion to work towards long-term goals and maintain interest even when encountering obstacles or slow progression. Individuals who score high on the grit scale tend to show stamina while working towards their goals, and they are able to maintain their effort over several years (Weinberg & Gould, 2019). Larkin et al. (2016) examined whether youth male football players who score low and high on the personality trait grit can be differentiated based on their sport-specific engagement and perceptual-cognitive expertise. The study received data by using the short grit scale (Grit-S) which is a self-answer questionnaire that measures the participants' grit level. The results showed that grittier players tend to put more hours into the sport and their long-term goals than less gritty players. Players who score higher on grit also tend to perform better on tests that measure their perception and understanding of the game, suggesting that grit could be a predictive factor of performance.

Pettersen et al. (2023) investigated whether psychological factors can predict performance in female football with a sample of 156 players from the top two leagues in Norway. Their findings did not suggest grit to be a predictor of performance but are encouraged to be looked further into. Meyer et al. (2017) examined differences in grit levels of athletes across performance levels. The study contained 305 female football players who play at four different levels ranging from Olympic level to NCAA level 3 (collegiate level). The results of this study found high scores in grit among athletes, with level 2 scoring significantly higher than level 3 after an age adjustment.

3 Study aim

It is still uncertain which psychological factors are relevant for optimizing female footballers' football skills, and to what extent these factors influence their football performances. Former research shows a tendency for higher performance levels to score higher on psychological factors (Pettersen et al., 2021). In this study, we explore how female football players from three different performance levels score on several psychological factors. The aim is to see how the scores from our data compare to previous studies and if there are any psychological factors that stand out between levels.

The hypotheses were:

Hypothesis 1: Female football players competing at higher performance levels exhibit higher scores on psychological factors compared to players competing at lower levels.

Hypothesis 2: Significant differences in scores for psychological factors among female football players will be observed when comparing three different performance levels.

4 Method

Quantitative method

Social science is often classified into two distinct categories; qualitative data collection, which involves the analysis of text-based information, and quantitative research, which are studies where the collection of numerical data is analyzed (Ringdal, 2020). Quantitative studies are often used to generalize data of bigger populations which are registered as numbers that can be compared statistically. This study used a quantitative approach.

Study design

This study has a cross-sectional design based on surveys. A survey utilizing multiple self-completion forms pertaining to various psychological factors was conducted to collect data. This method was used as it is the most appropriate for gathering data from a dispersed population and provides high anonymity for those participating in the survey (Ringdal, 2020).

Reliability and validity

Reliability and validity refer to the consistency and accuracy of measurements obtained by a particular instrument (Ringdal, 2020). High validity means that the instrument accurately measures what it is intended to measure, while high reliability means that repeated measurements using the same instrument produce consistent results. To ensure high validity, it is important to have high reliability. Two types of validity are typically distinguished in research: internal and external validity. Internal validity relates to the extent to which the results obtained from a study are valid for the sample and phenomenon being studied, while external validity concerns the degree to which the results can be generalized and applied to other samples for comparison purposes (Ringdal, 2020). When selecting a questionnaire in quantitative research, it is recommended to examine whether previously validated questionnaires can be used (Ringdal, 2020). This strengthens the prerequisites for the questionnaire to be valid. For this study, the variables of interest will be assessed using questionnaires designed to measure the specific psychological factors being targeted. These questionnaires have been tested and approved for their reliability as a data collection tool within the realm of sports. Reliability assumes that data is collected consistently for all participants and that all participants understand and interpret the questions correctly. It should be taken into consideration that measurement errors can occur.

Female football research center

The Female Football Research Centre (*FFRC*) is a research project based at UiT – The Arctic University of Norway- The project gathers information and knowledge on the various traits that impact the performance of female football players by studying the physiological and psychological factors and health-related elements. Their main goal is to gain new and essential understanding and information about the elements that affect the growth and well-being of female elite football players in a sustainable manner.

Data collection

The methods for this study have been chosen by the FFRC, and the dataset has been collected by the FFRC in its entirety.

Participants

The data contains answers from 188 female football players across 17 clubs in the two highest divisions in Norway, “Toppserien” (national 1st level, 97 participants) and “1. Divisjon” (national 2nd level, 59 players) and 32 participants from international leagues such as the Super League, Allsvenskan, Serie A Femminile and Vrouwen Eredivisie. The ranking order of these levels from highest to lowest are international level, national level 1 “Toppserien” and national level 2 “1 divisjon”. The mean age of the participants was 21.4 years.

Table 1 *Number of participants*

	<i>n</i>
National level 2 “1 divisjon”	59
National level 1 “Toppserien”	97
International level	32
Total	188

Anonymization

This study will not include any details that can track the participants. Therefore, information such as professional/amateur contracts, national team careers, or similar will not be used in this study.

Cronbach's alpha

Cronbach's alpha measures the reliability of a scale (Field, 2005). Cronbach's alpha is used to assess the degree to which variables are related to each other. The measures range from 0 – 1, with higher values indicating greater internal consistency.

Instruments

Motivation was measured by using the Sport Motivation Scale-6 (C. Mallett et al., 2007). The instrument consists of 24 items rated on a 7-point Likert Scale (1= does not correspond at all, 7 = corresponds exactly). The questionnaire is based on the question "Why do you practice your sport?" and consists of six subscales: amotivation (e.g., "I don't seem to be enjoying my sport as much as I previously did", identified regulation (e.g., "Because training hard will improve my performance"), external regulation (e.g., "For the prestige of being an athlete"), integrated regulation (e.g., "Because it is an extension of me"), introjected regulation (e.g., "Because I must do sports to feel good about myself") and intrinsic regulation (e.g., "For the satisfaction I experience while I am perfecting my abilities"). The Cronbach's alpha values of each sub-scale were: amotivation ($\alpha = .69$), identified regulation ($\alpha = .58$), external regulation ($\alpha = .62$), integrated regulation ($\alpha = .72$) introjected regulation ($\alpha = .72$) and intrinsic motivation ($\alpha = .72$).

Grit was measured using the Grit-S questionnaire (Duckworth & Quinn, 2009). Grit measures the ability to have passion and perseverance for long-term goals. The questionnaire consists of 8 items (e.g., "I am a hard worker") and is a shortened version of Grit-O which originally consists of 12 items. Items were rated on a 5-point Likert scale (1 = not at all like me, 5 = very much like me). Cronbach's alpha for the full scale was $\alpha = .74$.

MT was measured using the Sport Mental Toughness Questionnaire (SMTQ) (Sheard et al., 2009). This questionnaire has 12 items and consists of three subscales: confidence (e.g., "I have what it takes to perform well while under pressure"), constancy (e.g., "I am committed to completing the tasks I have to do"), and control (e.g., "I get anxious by events I did not expect or cannot control", reversed item). Items were rated on a 4-point Likert scale (1

= not true at all, 4 = very true). Cronbach's alpha values for each subscale were: Confidence ($\alpha = .69$), Constancy ($\alpha = .60$) and Control ($\alpha = .67$).

Self-regulated learning was measured with a football-specific questionnaire as seen in (Toering et al., 2013). The questionnaire consists of 22 items, divided into three subscales: Evaluation (e.g., "After each practice session I think about what I did right and wrong during the session"), Reflection (e.g., "During each practice session I check what I still have to do to reach my practice goal") and Planning (e.g., "I have a clear goal for each practice session"). Items were rated on a 5-point Likert scale (1 = never, 5 = always). Cronbach's alpha values for each subscale were: Evaluation ($\alpha = .86$), Reflection ($\alpha = .89$), and Planning ($\alpha = .82$).

Perceived motivational climate was assessed using the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2) (Newton et al., 2000). The instrument consists of 24 questions divided into two subscales of mastery climate (e.g., "My coach made sure players felt successful when they improved") and ego-oriented climate (e.g., "My coach substituted players when they made a mistake"). Items were rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Cronbach's alpha for each subscale were: Mastery climate ($\alpha = .91$) and Ego-oriented climate ($\alpha = .85$).

Procedure

The 20 teams in the top and second leagues in Norway were contacted via an email sent to the club's sports director or manager with information about the study. All teams were also offered a presentation of the project. Only three meetings with a presentation of the project were conducted physically, and the remaining eleven meetings were held digitally (i.e., Zoom) because of restrictions due to the Covid-19 pandemic. The three remaining teams declined a presentation due to time constraints but received written information about the study. The international teams were chosen on the background of the FIFA club ranking, where only the 50 best rated clubs in the world were contacted. If the club accepted the study invite, they were forwarded written information about the study.

Regardless of whether the teams received a written or an oral presentation of the project, players were encouraged to follow a link to answer the questionnaire online. The link was sent to the team's representative contact, which then distributed it to the players. Participants signed an online written consent form, with the option to withdraw at any time. The questionnaires were available in both English and Norwegian. After two weeks, the club,

represented by a contact person, received a reminder for the players to complete the questionnaire. A second reminder was sent after one month. The data collection started in March 2021 and was completed in February 2022. The project was deemed to be outside the jurisdiction of the Health Research Act by the Regional Ethics Committee North's mandate. The project was approved by NSD – Norwegian Centre for Research Data (project 133802). Data were collected electronically and stored at Services for Sensitive Data (SSD). All analyses were conducted using SPSS v.29.0 (SPSS, Inc., Chicago, IL, USA). The level of significance was set to .05.

The non-parametric Kruskal-Wallis test was conducted to investigate differences between the groups for psychological variables. This test was used as the data were not normally distributed. The Bonferroni correction was used to eliminate the risk of type I error by adjusting the alpha level depending on the number of pair-wise comparisons. All p-values were two-tailed and values below 0.05 were considered to indicate statistical significance. To visualize the variables that exhibited significant results, pairwise comparisons were conducted using SPSS (Figure 2). The figure employs a color-coding scheme to indicate the significance level of the values between the three levels.

5 Results

The results contain answers from 59 players from national level 2, 97 players from national level 1, and 32 from international levels, with a total of 188 participants (Table 1). Results from the Kruskal-Wallis test demonstrated that a mastery climate had a statistically significantly higher median score for Level 2 compared with the international level ($p = .005$), and a higher score in Level 1 compared with the international level ($p = .002$) respectively (Table 2). Further, the results of amotivation revealed a statistically significantly lower median score in Level 1 compared to Level 2 ($p = .002$). For SR – evaluation, there was a statistically significantly higher median score in Level 2 compared to Level 1 ($p = .011$). The results of external regulation found a statistically significantly lower median score in Level 2 compared to the international level ($p = .001$), and lower scores in Level 1 compared to the international level ($p = <.001$). No significant differences were found for either of the variables related to MT or grit (Table 2).

Table 3 shows the same variables as Table 2 using mean (and standard deviation (SD)) instead of median. Some of the variables have a higher mean value than the median (table 2) due to outliers.

Table 2 *Psychological variables at national and international levels.*

Psychological measurements	National Level 2	National Level 1	International Level	<i>p</i>	Kruskal-Wallis	Post-hoc multiple comparisons
Grit	3.75	3.63	3.88	.248	H (2) = 2.785	Not sig.
Evaluation	4.00	3.67	3.83	.036	H (2) = 6.642	Level 2 > Level 1 (<i>p</i> = .011)
Confidence	3.00	2.83	2.92	.438	H (2) = 1.651	Not sig.
Consistency	3.50	3.25	3.50	.055	H (2) = 5.790	Not sig.
Control	2.50	2.25	2.25	.438	H (2) = 3.909	Not sig.
Ego climate	2.39	2.39	2.69	.142	H (2) = 1.923	Not sig.
Mastery climate	4.18	4.29	3.82	.382	H (2) = 10.315	Level 2 > Intr. Level (<i>p</i> = .005) Level 1 > Intr. Level (<i>p</i> = .002)
Reflection	3.44	3.22	3.44	.006	H (2) = 5.234	Not sig.
Planning	2.71	2.50	2.71	.073	H (2) = 4.215	Not sig.
Amotivation	1.25	2.00	1.38	.122	H (2) = 9.884	Level 1 > Level 2 (<i>p</i> = .002)
Identified regulation	4.50	4.25	4.88	.007	H (2) = 4.002	Not sig.
External regulation	2.75	3.00	4.13	.135	H (2) = 12.652	Intr. Level > Level 2 (<i>p</i> = .001) Intr. Level > Level 1 (<i>p</i> = <.001)
Integrated regulation	5.25	5.13	5.50	.002	H (2) = 2.820	Not sig.
Introjected regulation	3.00	3.25	3.50	.244	H (2) = 4.336	Not sig.
Intrinsic regulation	5.75	5.50	5.50	.114	H (2) = 3.0	Not sig.

Table 2. *Psychological variables by national and international levels.* Median values and statistical significance by Kruskal-Wallis one-way Analysis of Variance.

Grit: measured on a five-point Likert Scale. Sr: measured on a 5-point Likert Scale. Motivational climate: measured on a 5-point Likert Scale. Sports motivation scale: measured on a 7-point Likert Scale. Mental toughness: measured on a 4-point Likert Scale.

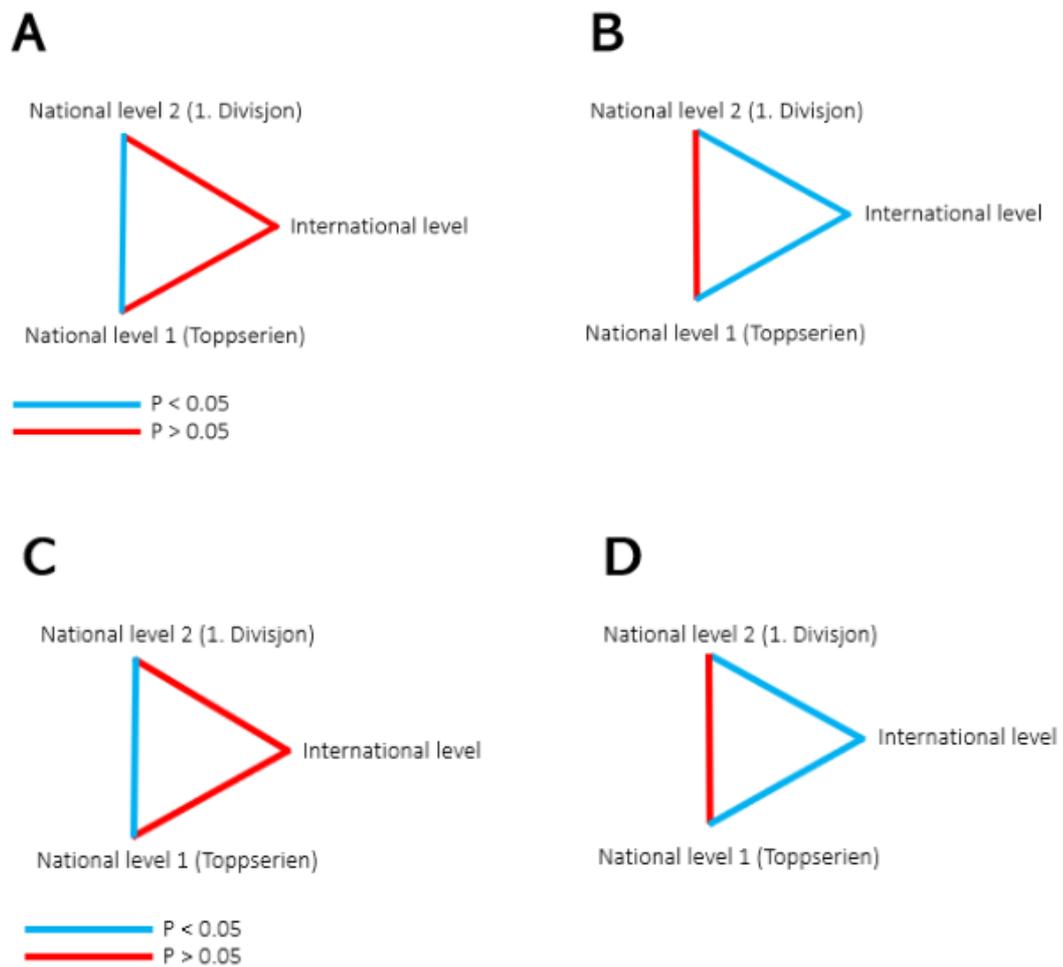
Table 3 Means and standard deviations for the study variables.

Variable	National Level 2	National Level 1	International level
	<i>M</i> (SD)	<i>M</i> (SD)	<i>M</i> (SD)
Evaluation	3.88 (.65)	3.56 (.77)	3.78 (.65)
Grit	3.80 (.48)	3.67 (.50)	3.69 (.54)
Confidence	2.96 (.37)	2.82 (.52)	2.93 (.33)
Consistency	3.38 (.52)	3.21 (.51)	3.36 (.42)
Control	2.35 (.67)	2.16 (.62)	2.16 (.53)
Ego climate	2.42 (.65)	2.46 (.58)	2.60 (.61)
Mastery climate	4.09 (.67)	4.09 (.68)	3.71 (.71)
Reflection	3.43 (.63)	3.19 (.74)	3.39 (.73)
Planning	2.70 (.64)	2.50 (.63)	2.65 (.69)
Amotivation	1.65 (.95)	2.27 (1.28)	2.08 (1.41)
Identified regulation	4.52 (1.05)	4.30 (1.08)	4.70 (1.26)
External regulation	3.13 (1.20)	3.12 (1.07)	4.0 (1.28)
Integrated regulation	5.23 (1.07)	5.03 (1.03)	5.30 (1.31)
Introjected regulation	3.13 (1.21)	3.55 (1.27)	3.49 (1.45)
Intrinsic regulation	5.66 (.96)	5.34 (1.07)	5.47 (1.03)

Table 3. Means and standard deviations for the study variables. Mean values and statistical significance by Kruskal-Wallis one-way Analysis of Variance. National Level 2 = 1. divisjon, National Level 1 = Toppserien. Grit: measured on a five-point Likert Scale. Sr: measured on a 5-point Likert Scale. Motivational climate: measured on a 5-point Likert Scale. Sports motivation scale: measured on a 7-point Likert Scale. Mental toughness: measured on a 4-point Likert Scale.

Figure 2 *Main findings in the present study.*

Post-hoc comparisons



The figure employs a color-coding scheme to indicate the significance level of the values between the three levels. Adjusted P-values from the Kruskal Wallis test for the amotivation (A), mastery climate (B), self-regulation – evaluation (C), and external regulation (D), between national level 2, national level 1, and international level female football players.

6 Discussion

Main findings

The main aim of this study was to compare scores on various psychological factors such as MT, grit, and motivation, between three different levels in women's football. The results showed that there were differences in mastery climate where the international level had significantly lower scores than both national level 1 and national level 2. Further, national level 1 scored significantly higher on amotivation compared to national level 2. There was also a difference in the self-regulated learning subscale evaluation, where national level 2 had significantly higher scores than national level 1. The international level had significantly higher scores of external regulation than both national level 1 and national level 2. In addition, the results showed no difference in grit and MT between the player levels.

Given the sparse amount of research on how mastery climate affects performance, the present findings may be of interest. The results of this study showed higher scores of mastery climate within both national levels 1 & 2 compared to the international level. Pettersen et al. (2023) found that a perceived mastery climate is a significant factor in individual performance among female soccer players at the national level. It is worth noting that, as the study in question focuses on individual performance, the performance is measured based on the athletes' current level rather than predicting their level of play. These results may consider mastery climate to be an important factor for players to reach their potential, but compared to the results of this study mastery climate cannot be a predictor of performance level. Previous research by Alvarez et al. (2012) and Weiss et al. (2009) found that a positive mastery climate can enhance athletes' intrinsic motivation, which could be a factor in athletes' development within their respective sports. Therefore, maintaining a positive mastery climate is imperative for facilitating the athletes' progression and achieving their goals. Our findings may correspond with these studies as results show significantly higher scores at the national levels compared to the international level. Younger players are likely to play in teams at lower levels to develop while aiming to reach a higher performance level in the future. For that reason, development is also likely to be an important factor for both national level 1 and 2. International level scoring lower on this variable could be expected based on the level they compete at. The environment these players belong to may have higher demands of competing for silverware or qualifying for prestigious tournaments rather than developing individuals. Our findings indicate that a higher perceived mastery climate does not translate to a better performance level.

National level 1 stands out by having a significantly higher score of amotivation than national level 2. These findings are unexpected considering their high scores of perceived mastery climate. As amotivation describes whether an athlete has no interest to engage in their sport (Weinberg & Gould, 2019), low values are expected within the levels in this study. Scores of evaluation are also significantly lower at national level 1 compared to national level 2. Since positive feedback is related to higher levels of intrinsic motivation (Vallerand, 1983; Weiss et al., 2009), a lack of evaluation could cause low scores which may affect the scores of amotivation negatively. Other reasons for the higher score could be athletes who are nearing the end of their career, feeling that their potential is reached, suffering from injuries, or have been affected by poor performance recently which may have influenced the result.

Our study found significantly lower scores of the SR subscale evaluation at national level 1 compared to national level 2. Contrary, few or no former studies have found evaluation to be a predictor for performance in female football. Variables related to self-regulation are assumed to provide an indication of how much ownership athletes take over their own learning without guidance from a coach or sport psychologist (Weinberg & Gould, 2019). It is not certain what causes the differences in scores between performance levels, but factors such as actively using tools that make athletes more aware of evaluating their own performance could be a factor. Examples could be evaluating training or games by using apps, or to what degree coaches follow up and interact with the players individually after training and games. Although there are differences between performance levels, there are no indications of evaluation being a decisive factor in reaching an elite level as there are no significant differences between national level 2 and the international level. This is backed up by Toering et al. (2012) who found no differences in evaluation between youth football players at an elite level and national level.

The score of external regulation indicates that the actions of players at the international level are more regulated by external factors such as salary or constraints within their team. There are few or no studies related to external regulations' effect on performance within sports. These results may occur due to the level at which these clubs compete, when players play for clubs at a certain level, the bar for what is expected of them both on and off the pitch is likely to rise. Based on the SMS, high scores of external regulation are not likely to have a positive effect on players' desire to work harder compared to more intrinsic factors (Weinberg & Gould, 2019). The results could be expected since the players at this level are more likely to be full-time professionals than the players at lower levels. The results of the

subscales closer to intrinsic motivation are of no significant difference between levels which implies that players at the international level have similar reasons as to why they play football, but there may be more external assets that play a part at the higher level. However, external factors may be positive assets to enhance performance. An example is if a player earns a salary from playing football which makes it possible to rest between sessions, instead of having to work or study which will affect their total load. If the player gains more energy from being a full-time professional, it could positively affect their performance.

Prior studies by Danielsen (2017) and Kristjánisdóttir et al. (2019) measured female football players' MT. These studies found those who played at a higher level scored significantly higher on MT than those playing at lower levels, indicating that there is a relationship between MT scores and the teams' performance level. This does not correlate with our findings, which show no significant differences in MT scores between any levels. These findings may be affected by the results of mastery climate that show significantly higher scores of perceived mastery climate at lower levels compared to the international level. Since a positive mastery climate could be a factor in reducing stress (Pensgaard & Roberts, 2000) it can be argued that when athletes experience a positive mastery climate, the need for strong MT may decrease. There was anticipation as to whether the results of this study would correspond with previous research, therefore it is of interest that we did not find any significant differences between performance levels in contrast to previous studies.

Our results do not show differences in grit scores between any levels. This is of interest due to the sparse amount of research on this psychological factor in female football. There have been contradicting findings in prior studies, therefore, there was anticipation as to whether significant findings would be made between performance levels on this variable. A study by Larkin et al. (2016) found grittier players to have a better understanding of the game, suggesting grit to be a relevant factor in predicting performance level. A study by Meyer et al. (2017) found female football players to score high on grit across four levels, with significant differences between collegial levels 2 and 3. Pettersen et al. (2023) found no significant findings of grit in a study exploring psychological factors' effect on individual performance. Although national level 1 and national level 2 are ranked lower than the international level, it still requires a lot of time and effort. For this reason, since athletes at lower levels may not have the same external motivational factors, it could be expected that they also score high on grit. Despite there being no indications that grit predicts which performance levels female football players compete at, it is still likely to be an important factor in realizing the potential

of the athletes. As previous studies are somewhat opposing, more studies are needed to validate the causal relationship between grit and performance.

Self-determination theory

The SDT argues that competence, autonomy, and relatedness are important factors in gaining intrinsic motivation. The significant difference in external regulation indicates that those who play at the international level have less perceived autonomy than those who play at lower levels. These results fit well with the median scores of mastery climate being higher at the lower levels (Table 3), as mastery-orientated climates are considered to enhance autonomy, competence, and relatedness (Alvarez et al., 2012). Even though the results show that players at the international level may have less autonomy, no indications are suggesting that it has a negative impact on their motivation to play football as the same players score low on amotivation, as well finding no differences between levels in other variables related to intrinsic motivation. Players who operate at a high level can be positively influenced by the feeling of being in a place with sufficient competence, and thus feel that they are experiencing personal growth by belonging to such an environment. Taking the results into consideration, one could consider the SDT as a good theoretical framework for creating motivation among athletes at the levels examined in this study.

Achievement Goal Theory

Athletes who are mastery-orientated are more likely to sustain their motivation compared to athletes in ego-orientated climates (Weinberg & Gould, 2019). It is also important to consider that even though the perceived mastery climate is significantly lower at the international level than at national level 1 and level 2, the international level does have scores that imply that they can be considered mastery orientated to some degree. This indicates that even though these clubs and their players compete at a high level, there is still an environment that considers it to be important to achieve good performances and master new tasks to succeed. Lower mastery climate scores at the international level don't rule out the possibility that higher perceived mastery climate scores at lower levels may have contributed to these players' success. Professional athletes often have a fundamental motivation that underlies their engagement in their sport (Pensgaard & Hollingen, 2006), this may prevent their intrinsic motivation from being reduced by a lower perceived mastery climate. It should be taken into consideration that we do not know how many of the players at the international level are professional, but it is likely to be a significant amount based on the

level they play at. Our data do not suggest that psychological factors increase along with performance levels. However, based on the achievement goal theory and former studies, psychological factors such as perceived mastery climate is still considered to be relevant for athletes' development and performance (Pettersen et al., 2023; Weinberg & Gould, 2019).

Strengths

This study collected its data from five different questionnaires which are related to each of the psychological factors we are investigating. All questionnaires are validated and are widely used for research purposes. This method makes it more likely for participants to answer what they think and feel as the answers are submitted anonymously. As well as gaining high reliability, the data for every level is converted into numbers, making them effective for comparisons. Another method for data collection could be to carry out interviews which could give a more reflected and nuanced insight into the participants' answers. However, it would be more time-consuming and would make it harder to compare levels as each answer would need to be interpreted individually. Furthermore, interview settings will not provide complete anonymity for participants, which increases the risk that responses may not accurately reflect their true feelings or thoughts, and that participants may be hesitant to provide comments that could be perceived as critical. Therefore, questionnaires are seen as the optimal instrument to gather data for this study.

The number of participants is comparable to several previous studies in the same field and is considered satisfactory. The maximum number of players in a squad usually is 25 players, the national level 1 sample consists of 97 players, which is the equivalent of four squads and should be considered a strong sample. National level 2 consists of 59 players and is also considered sufficient.

This study compares three different levels within female football which is considered to strengthen the outcome of our results. By comparing three different levels of performance, we gain a more nuanced insight into at which level potential changes in variables occur. By including both national and international levels we can investigate which psychological factors stand out between countries and cultures, which will be useful to clarify what to enhance when trying to get to a higher level, both in Norway and abroad. In addition, the originality of this study is important since it investigates a topic in that there is a limited amount of research. Therefore, our data will be useful in creating a comprehensive understanding of how psychological factors influence performance.

Limitations

The sample size of 32 players at the "international level" is approximately equivalent to one and a half squads and could be considered sufficient. However, to strengthen the sample, it would be beneficial to have a larger number of participants at the international level. This would increase the likelihood of including players from various positions and with different statuses (starters, injured, limited playing time, etc.). Furthermore, it is important to acknowledge that the current study is limited to the leagues that have been explored, as there are several leagues and nations not involved in the research. Another factor to consider is the timing of when the questionnaires were collected. The Norwegian leagues start and end at different times of the year compared to some of the leagues at the international level. Teams in the early stages of their seasons might experience less pressure to achieve immediate results compared to those in the final stages. Clubs battling relegation or competing for top positions may prioritize achieving results instead of focusing on their performance. Additionally, it is worth noting that the inclusion of identified regulation in the research, despite a Cronbach alpha score of $\alpha = .58$, presents another limitation. Although no significant findings were observed within this variable, its inclusion in the study may raise questions regarding its validity.

The results indicate that there is already a high mastery climate, particularly at the national levels. It will be important to maintain a highly mastery-focused environment as it has been found to affect individual performance within female football (Pettersen et al., 2023). It could be useful to investigate what contributes to the high score for amotivation in national level 1 as this could have a highly negative impact in the long run. High amotivation suggests that athletes are dissatisfied or feel a lack of control, which can lead to them not caring about their sport anymore (Weinberg & Gould, 2019). This can be done by handing out questionnaires where the players are able to give feedback anonymously to their coaches. The players being able to give feedback anonymously could make it more likely for them to be truthful. This could be beneficial to finding the reason why scores of amotivation are higher at national level 1 and enable football clubs to implement initiatives to prevent amotivation. It is possible that incorporating mental training into everyday football training, alongside physical, tactical, and technical training, could be a means of enhancing psychological factors and improving athletic performance (Barnicle, 2013).

It could be debated whether psychological factors should be investigated to predict performance at a group level. Danielsen (2017) found higher scores of MT across performance levels of female football players. However, this study specified that their findings do not suggest that MT predicts individual performance levels. Comparing performance at group levels can be negatively influenced by the many different factors that contribute to the outcome of performance. An individually good performance can be negatively affected by the poor performance of the remaining players on the team. Thus, the individual performance may not reflect the outcome of the players' psychological score. It may be more suitable to compare psychological scores to the players' individual performances using an objective instrument, as done in a study by Pettersen et al. (2023). This method may give a clearer indication of what psychological factors affect performances, although individually and not as a group.

7 Conclusion

Our study found significant differences between performance levels in four psychological factors (mastery climate, motivation, evaluation, and external regulation) but suggests that high levels of these factors do not necessarily correspond with higher performance levels.

Further research should be done on each psychological factor to get a broader understanding of to what degree they affect performance, individually and as a group.

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Appendix

1. Sports motivation scale - 6
2. Grit S
3. Sport Mental Toughness Questionnaire
4. Perceived mastery climate in Sport Questionnaire-2
5. Self-regulation Questionnaire

1. Sports motivation scale-6 (C. Mallett et al., 2007)

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practising your sport.

Does not correspond at all	Corresponds a little		Corresponds moderately	Corresponds a lot		Corresponds exactly	
1	2	3	4	5	6	7	
<i>Why do you practice your sport?</i>							
1. For the excitement I feel when I am really involved in the activity	1	2	3	4	5	6	7
2. Because it's part of the way in which I've chosen to live my life	1	2	3	4	5	6	7
3. Because it is a good way to learn lots of things which could be useful to me in other areas of my life	1	2	3	4	5	6	7
4. Because it allows me to be well regarded by people that I know	1	2	3	4	5	6	7
5. I don't know anymore; I have the impression of being incapable of succeeding in this sport	1	2	3	4	5	6	7
6. Because I feel a lot of personal satisfaction while mastering certain difficult training techniques	1	2	3	4	5	6	7
7. Because it is absolutely necessary to do sports if one wants to be in shape	1	2	3	4	5	6	7
8. Because it is one of the best ways I have chosen to develop other aspects of my life	1	2	3	4	5	6	7
9. Because it is an extension of me	1	2	3	4	5	6	7
10. Because I must do sports to feel good about myself	1	2	3	4	5	6	7
11. For the prestige of being an athlete	1	2	3	4	5	6	7
12. I don't know if I want to continue to invest my time and effort as much in my sport anymore	1	2	3	4	5	6	7
13. Because participation in my sport is consistent with my deepest principles	1	2	3	4	5	6	7
14. For the satisfaction I experience while I am perfecting my abilities	1	2	3	4	5	6	7
15. Because it is one of the best ways to maintain good relationships with my friends	1	2	3	4	5	6	7
16. Because I would feel bad if I was not taking time to do it	1	2	3	4	5	6	7
17. It is not clear to me anymore; I don't really think my place is in sport	1	2	3	4	5	6	7
18. For the pleasure of discovering new performance strategies	1	2	3	4	5	6	7
19. For the material and/or social benefits of being an athlete	1	2	3	4	5	6	7
20. Because training hard will improve my performance	1	2	3	4	5	6	7
21. Because participation in my sport is an integral part of my life	1	2	3	4	5	6	7
22. I don't seem to be enjoying my sport as much as I previously did	1	2	3	4	5	6	7

23. Because I must do sports regularly	1	2	3	4	5	6	7
24. To show others how good I am at my sport	1	2	3	4	5	6	7

Key

Amotivation	5, 12, 17, 22	Identified Regulation	3, 8, 15, 20
External Regulation	4, 11, 19, 24	Integrated Regulation	2, 9, 13, 21
Introjected Regulation	7, 10, 16, 23	Intrinsic Motivation	1, 6, 14, 18

2. Short Grit Scale questionnaire (Duckworth & Quinn, 2009)

Short Grit Scale

Directions for taking the Grit Scale: Please respond to the following 8 items. Be honest – there are no right or wrong answers!

1. New ideas and projects sometimes distract me from previous ones.*
 - Very much like me
 - Mostly like me
 - Somewhat like me
 - Not much like me
 - Not like me at all

2. Setbacks don't discourage me.
 - Very much like me
 - Mostly like me
 - Somewhat like me
 - Not much like me
 - Not like me at all

3. I have been obsessed with a certain idea or project for a short time but later lost interest.*
 - Very much like me
 - Mostly like me
 - Somewhat like me
 - Not much like me
 - Not like me at all

4. I am a hard worker.
 - Very much like me
 - Mostly like me
 - Somewhat like me
 - Not much like me
 - Not like me at all

5. I often set a goal but later choose to pursue a different one.*

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

6. I have difficulty maintaining my focus on projects that take more than a few months to complete.*

- Very much like me
 - Mostly like me
 - Somewhat like me
 - Not much like me
 - Not like me at all
-

7. I finish whatever I begin.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

8. I am diligent.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all

Scoring:

1. For questions 2, 4, 7 and 8 assign the following points:
5 = Very much like me
4 = Mostly like me
3 = Somewhat like me
2 = Not much like me
1 = Not like me at all

2. For questions 1, 3, 5 and 6 assign the following points:
1 = Very much like me
2 = Mostly like me
3 = Somewhat like me
4 = Not much like me
5 = Not like me at all

Add up all the points and divide by 8. The maximum score on this scale is 5 (extremely gritty), and the lowest score on this scale is 1 (not at all gritty).

Grit Scale citation

Duckworth, A.L., & Quinn, P.D. (2009). Development and validation of the Short Grit Scale (Grit-S). *Journal of Personality Assessment, 91*, 166-174.

<http://www.sas.upenn.edu/~duckwort/images/Duckworth%20and%20Quinn.pdf>

Duckworth, A.L., Peterson, C., Matthews, M.D., & Kelly, D.R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 9*, 1087-1101.

<http://www.sas.upenn.edu/~duckwort/images/Grit%20JPSP.pdf>

4. Perceived Motivational Climate in Sport Questionnaire (Newton et al., 2000)

Perceived Motivational Climate in Sport Questionnaire (PMCSQ-2)

Directions: Please think about how it has felt to play on your team throughout this season. What is it usually like on your team? Read the following statements carefully and respond to each in terms of how you view the typical atmosphere on your team. Perceptions naturally vary from person to person, so be certain to take your time and answer as honestly as possible. Circle the number that best represents how you feel.

- | | | | | | | | | |
|------|---|-------------------|---|---|---|---|---|----------------|
| 1.) | On this team, the coach wants us to try new skills. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 2.) | On this team, the coach gets mad when a player makes a mistake. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 3.) | On this team, the coach gives most of his or her attention to the stars. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 4.) | On this team, each player contributes in some important way. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 5.) | On this team, the coach believes that all of us are crucial to the success of the team. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 6.) | On this team, the coach praises players only when they outplay teammates. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 7.) | On this team, the coach thinks only the starters contribute to the success of the team. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 8.) | On this team, players feel good when they try their best. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 9.) | On this team, players are taken out of a game for mistakes. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 10.) | On this team, players at all skill levels have an important role on the team. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 11.) | On this team, players help each other learn. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 12.) | On this team, players are encouraged to outplay the other players. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 13.) | On this team, the coach has his or her own favorites. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 14.) | On this team, the coach makes sure players improve on skills they're not good at. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 15.) | On this team, the coach yells at players for messing up. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |
| 16.) | On this team, players feel successful when they improve. | Strongly Disagree | 1 | 2 | 3 | 4 | 5 | Strongly Agree |

17.)	On this team, only the players with the best 'stats' get praise.	Strongly Disagree 1	2	3	4	Strongly Agree 5
18.)	On this team, players are punished when they make a mistake.	Strongly Disagree 1	2	3	4	Strongly Agree 5
19.)	On this team, each player has an important role.	Strongly Disagree 1	2	3	4	Strongly Agree 5
20.)	On this team, trying hard is rewarded.	Strongly Disagree 1	2	3	4	Strongly Agree 5
21.)	On this team, the coach encourages players to help each other.	Strongly Disagree 1	2	3	4	Strongly Agree 5
22.)	On this team, the coach makes it clear who he or she thinks are the best players.	Strongly Disagree 1	2	3	4	Strongly Agree 5
23.)	On this team, players are 'psyched' when they do better than their teammates in a game.	Strongly Disagree 1	2	3	4	Strongly Agree 5
24.)	On this team, if you want to play in a game you must be one of the best players.	Strongly Disagree 1	2	3	4	Strongly Agree 5
25.)	On this team, the coach emphasizes always trying to do your best.	Strongly Disagree 1	2	3	4	Strongly Agree 5
26.)	On this team, only the top players 'get noticed' by the coach.	Strongly Disagree 1	2	3	4	Strongly Agree 5
27.)	On this team, players are afraid to make mistakes.	Strongly Disagree 1	2	3	4	Strongly Agree 5
28.)	On this team, players are encouraged to work on their weaknesses.	Strongly Disagree 1	2	3	4	Strongly Agree 5
29.)	On this team, the coach favors some players more than others.	Strongly Disagree 1	2	3	4	Strongly Agree 5
30.)	On this team, the focus is to improve each game/practice.	Strongly Disagree 1	2	3	4	Strongly Agree 5
31.)	On this team, the players really 'work together' as a team.	Strongly Disagree 1	2	3	4	Strongly Agree 5
32.)	On this team, each player feels as if they are an important team member.	Strongly Disagree 1	2	3	4	Strongly Agree 5
33.)	On this team, the players help each other to get better and excel.	Strongly Disagree 1	2	3	4	Strongly Agree 5

5. Self-regulation questionnaire (Toering et al., 2013)

	Reflection ($R^2 = 25.4\%$)	Planning ($R^2 = 10.2\%$)	Evaluation ($R^2 = 6.5\%$)	Speaking Up ($R^2 = 5.4\%$)	Coaching ($R^2 = 4.7\%$)
1. Each practice session I think about both my strengths and weaknesses and of ways that I can improve them.	0.62				
2. During each practice session I check whether I make progress in my football skills.	0.53				
3. I know my strengths and weaknesses and at each practice session I plan how I can improve them.	0.69				
4. During each practice session I keep track of my football performance relative to my practice goal (so that I know where I stand).	0.65				
5. Each practice session I try to identify my strengths and think about ways to improve these even more.	0.52				
6. Each practice session I work on my strengths and weaknesses because I believe in my potential as a football player.	0.66				
7. Each practice session I focus on my practice goal.	0.65				
8. During each practice session I check what I still have to do to reach my practice goal.	0.62				
9. Each practice session I try to identify my weaknesses and think about how to improve these.	0.58				
10. I have a clear goal for each practice session.	(0.40)	0.49			
11. Before each practice session I plan which skills I want to work on during the session.		0.50			
12. Each practice session I use information from TV/Internet/live football matches to become a better football player.		0.57			
13. Before each practice session I plan my actions relative to the goal I want to attain during the practice session.		0.55			
14. Each practice session I use information from books, magazines, and interviews about elite players to develop myself as a football player.		0.58			
15. I come early for each practice session in order to work on specific skills.		0.67			
16. After each practice session I stay to work on specific skills.		0.64			
17. Each practice session I think back and evaluate whether I did the right things to become a better player.			0.63		
18. After each practice session I think back at situations I've been through during practice and use this information to practice specific situations either alone or together with others.			0.52		
19. Each practice session I keep track of my performance during practice, so that I can see which football skills I must improve (for example, technique, tactics).			0.45		
20. After each practice session I think back and evaluate whether I did the right things to reach my practice goal.			0.66		
21. After each practice session I think about what I did right and wrong during the session.			0.77		
22. After each practice session I think back at specific practice situations and what I did right and wrong.			0.81		
23. If I don't understand the coach's explanation, I ask the coach about it.				0.69	
24. During practice I ask for help if I need help to improve my football performance/ football skills.				0.75	
25. Each practice session I ask the coach what I can do to become a better football player.				0.63	
26. Each practice session I discuss with my coach which aspects of my football performance need improvement.				0.54	
27. If the coach changes an exercise and I don't understand the change, I ask the coach to explain.				0.73	
28. During practice I speak up if I don't understand something or if I don't agree with teammates or the coach.				0.65	
29. I coach my teammates during each match-play or position play during practice.					0.89
30. Each practice session I coach my teammates during match-play or position play.					0.86

