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## Stressors, perceived stress responses, and coping strategies in professional esports players: A qualitative study

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### Abstract

To inform future intervention strategies and enhance professional esports players' performance. This qualitative study investigated stressors, perceived stress responses and coping strategies experienced by professional League of Legends players. Following criterion-based sampling, semi-structured interviews with 12 professional esports players were performed. The findings illustrate a variety of stressors related to team, performance, audience, and social media. Whereas players reported that perceived stress responses prior to competition (e.g., nervousness and excitement) seemed to be suppressed during competition, post-competition responses appeared to relate to the outcome of competition. Although a range of strategies were identified, players most frequently communicated with teammates or coaches and focused on performance when coping with stressors. Study results demonstrate a need to gain an in-depth understanding of stressors, coping strategies, and their effects on performance. In addition, it seems beneficial to teach players how to recognize and regulate perceived stress responses.

**Keywords:** Competitive gaming; League of Legends, psychological stress, performance; emotions; critical realism

### Highlights

- Professional League of Legends players experience a variety of stressors such as team issues, performance expectations, audience, and social media.
- Perceived stress responses were most prevalent prior to competition and after competition.
- Whereas players reported that perceived stress responses seemed to be suppressed during competition, post-competition responses were associated with the outcome of competition.

- Players stated that they most frequently communicated with teammates or coaches and used problem-focused coping strategies to manage stressors such as performance expectations.

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## Introduction

Research in traditional sport has emphasized the relationship between high levels of perceived stress and reduced performance (Jones & Hardy, 1990; Lazarus, 2000). It therefore seems plausible that stress might also impact performance in esports given the demands placed on performers (Himmelstein et al., 2017). Although it seems unclear whether esports can be classified as sports (Jenny et al., 2016), the competitive and stressful environments within which esports players perform are similar to other competitive sport environments (Leis & Lautenbach, 2020). Even though recent reviews provided first insights on the psychological characteristics of esports (Bányai et al., 2019; Leis & Lautenbach, 2020; Pedraza-Ramirez et al., 2020), little is known about psychological stress in esports and its effects on performance. Recently, obstacles encountered by competitive gamers have been identified, including trouble performing under pressure and inadequate physical and mental preparation (Himmelstein et al., 2017). Given the increasing number of competitors (Cunningham et al., 2018), a better understanding of psychological stress in competitive esports environments and its effects on motor and cognitive abilities is needed to help players achieve peak performance (Leis & Lautenbach, 2020; Poulus et al., 2020; Smith et al., 2019). In addition, more in-depth knowledge about psychological stress in esports could inform psychological training strategies (Leis et al., 2021). To this end, this study aims to provide new insights into professional players' subjective experience of stressors, perceived stress responses, and coping strategies.

### *Transactional theory of stress*

In general, research on stress and coping has been informed by Lazarus' transactional theory of stress (Lazarus & Folkman, 1984) and cognitive-motivational-relational theory of stress and emotions (Lazarus, 1999). In line with the transactional perspective, Fletcher et al. (2006) developed a meta-model of stress, emotion and performance highlighting the emotion-performance relationship in the context of sport. According to their meta-model, stressors arise from performers transacting with their environments. They are mediated by perception, appraisal, and coping leading to associated responses and outcomes. Whereas stressors refer to the environmental demands or situations encountered by the individuals (Fletcher et al., 2006), coping can be defined as cognitive and behavioral efforts to manage stressors (Lazarus & Folkman, 1984). Previous research has classified coping strategies in different ways (Crocker et al., 2015; Nicholls & Polman, 2007; Nicholls et al., 2016). The majority of research classifies coping into problem-focused (i.e., efforts of changing or eliminating a stressor), emotion-focused (i.e., efforts of regulating emotional processes), avoidance-focused (i.e., efforts of disengaging from a stressor), approach-focused (i.e., efforts to attend to a stressor to reduce or manage the unpleasant experience), and appraisal-focused coping (i.e., efforts to re-evaluate a stressor; Norris et al., 2017). In general, problem-focused coping has been associated with higher perceived effectiveness compared to, for example, avoidance coping (Nicholls et al., 2010; Kaiseler et al., 2009).

### *Empirical evidence*

Guided by Lazarus' transactional perspective, research has provided insights on stressors, perceived stress responses, and coping strategies among sport performers (Arnold et al., 2017; Didymus & Fletcher, 2017; McGreary et al., 2020; Neil et al., 2016; Swettenham et al., 2020). Studies have shown that athletes experience a variety of competitive (e.g., expectations and

underperforming), personal (e.g., nonsporting life events), and organizational stressors (e.g., cultural and team issues; Arnold & Fletcher, 2012; Sarkar & Fletcher, 2014). In addition, research has provided knowledge on athletes' positive (e.g., happiness and excitement) as well as negative responses (e.g., anger, anxiety, and disappointment) to stressors (Fletcher et al., 2012; Neil et al., 2011; Neil et al., 2016), with unpleasant emotions primarily relating to lower performance levels (Campo et al., 2019; Rathschlag & Memmert, 2015; Uphill & Jones, 2007). Furthermore, a large number of coping strategies in sport performers – such as problem focused (e.g., increasing effort), emotion focused (e.g., venting unpleasant emotions), and avoidance coping strategies (e.g., cognitive distancing) – have been identified (Crocker et al., 2015; Nicholls & Polman, 2007). Consequently, this body of literature provides a strong basis to underpin interventions in traditional sports. To help design evidence informed interventions in the specific competitive esports environment, research is warranted to examine the individual stressors, perceived stress responses, and coping in esports.

A recent study on 316 esports players (13% professional players) identified technical issues and antisocial behavior as stressors, whereas mental toughness was associated with the selection of more problem and emotion focused strategies, and less avoidance coping strategies (Poulus et al., 2020). While a recent review on psychophysiological stress in esports reported mixed results on stress responses in competitive settings (Leis & Lautenbach, 2020), Mendoza et al. (2021) showed higher cortisol levels, cognitive anxiety and perceived match importance in expert esports players than non-expert players. Both studies highlight the need for in-depth, high quality studies examining stress in esports.

Despite the need for more in-depth examinations of stress, there has been a limited number of qualitative studies on stressors, perceived stress responses, and coping in esports. Studies on amateur League of Legends (LoL) players have provided insights into obstacles encountered (e.g., confidence issues), techniques used to achieve optimal performance (e.g., playing smart; Himmelstein et al., 2017), emotional triggers (e.g., achievement and teammates), and regulation strategies (e.g., avoidance and using emotional support; Kou & Gui, 2020). Research has also indicated a relationship between emotional responses and performance in esports (in the football simulation video game FIFA: Behnke et al., 2020; Counter-Strike: Global Offensive; CS:GO: Behnke et al., 2021; in LoL: Kou & Gui, 2020). For instance, Behnke et al. (2020) acknowledged that pleasant emotions can mediate performance.

Research on professional CS:GO players demonstrated a variety of stressors such as team issues (e.g., communication issues), individual issues (e.g., life balance), scrutiny and criticism (e.g., social media), and event issues (e.g., media interviews). While a number of emotion- (e.g., listening to music, counting to 10) as well as problem-focused coping strategies (e.g., communicating with teammates) were highlighted, players of this first-person shooter game primarily used avoidance-based coping strategies during performance (e.g., playing more passively). Although these studies provide the first insights into stressors, perceived emotional responses and coping strategies, further research with professional esports players is necessary to advance this understanding and ultimately inform evidence-based interventions. Research has identified differences in characteristics of respective esports games such as physical and cognitive demands (Campbell et al., 2018; Pedraza-Ramirez et al., 2020). For instance, CS:GO players seem to require higher levels of precise perceptual-motor performance, while LoL players need more in-depth knowledge of character capabilities (Bonny et al., 2016). Therefore, differences in stressors, perceived stress responses and coping strategies between LoL and CS:GO can be expected. In

comparison to previous studies (Poulus et al., 2020; Smith et al., 2019; Kou & Gui, 2020), this present study will focus on both emotional responses and perceived stress responses (i.e., psychological, physical, and behavioral responses to stressors). Therefore, the main aim of this present qualitative study is to provide new insights into stressors experienced by professional LoL players, perceived stress responses and coping strategies.

## Methodology

A qualitative approach was utilized to gain a deeper understanding of stressors, perceived stress responses and coping strategies in professional LoL competitors. Using the philosophical position of critical realism (Bhaskar, 1979), semi-structured interviews were used to collect rich, descriptive data from various perspectives that capture the subjective meaning of contextual situations (Kvale & Brinkmann, 2009). Using this realist and subjectivist philosophical position, we focused on professional players' experiences within the competitive high-level esports environment. The study was pre-registered through the Open Science Framework: (<https://osf.io/5j38k/>).

## Situating the Researchers

In line with our subjectivist standpoint, the backgrounds of each author will be described to understand how their respective interpretations of data might be impacted. All authors have performed studies on stress in the sport context. OL is a male PhD candidate, who has developed his understanding of the competitive structure of esports, terminology used and competitive strategies over the past years. FL is a female researcher experienced with researching emotions and psychophysiology of performance. PB is a male researcher, who has previously investigated stressors and coping in professional esports players. AME is a female researcher with expertise in psychological aspects of performance and psychological skills training. OL, FL, and AME work in the same department in Germany, whereas PB is situated in the United Kingdom.

## Participants

Participants ( $n = 12$ ) were professional male LoL players ranging between 19 and 28 years of age ( $M = 21.83$ ,  $SD = 2.85$ ) and among the three highest ranks worldwide in LoL (lowest to highest: iron, bronze, silver, gold, platinum, diamond, master, grandmaster, and challenger). Thus, players were ranked challenger ( $n = 7$ ), grandmaster ( $n = 2$ ), and master ( $n = 3$ ). Overall, the interviewees had between 6 and 11 years of experience playing LoL ( $M = 8.83$ ,  $SD = 1.52$ ). The participants reported to spend between 28 and 91 hours per week playing LoL ( $M = 56.92$ ,  $SD = 20.61$ ). Eight players were from Germany and one player was from each of the following countries: Czech Republic, Slovenia, Sweden, and the United Kingdom. Inclusion criteria for this study required participants to be competitors in the second German division or higher and competing is their main source of income. As interviewers in this study were only able to speak English or German fluently, language proficiency either of these languages was a third inclusion criteria.

## Procedures

Players were recruited and sampled purposefully (Patton, 2002) through contacting esports clubs and via personal email. The study complied with the Declaration of Helsinki and APA ethical

guidelines. After interviewees signed informed consent, interviews were performed during the competitive season and approximately three days after a competitive match. To gain a true and non-judgmental account of players' subjective experience of stress, participants were told that the aim of the study was to investigate subjective experiences of competing in esports. Each participant was interviewed by author OL in a location of their choice, either face-to-face ( $n = 6$ ) or via TeamSpeak (software for audio communication;  $n = 6$ ). No other person was present during the recording. Face-to-face interviews were recorded with a regular digital recorder and TeamSpeak interviews were recorded using embedded recording functions. To help interviewees feel comfortable prior to audio-recording, the interviewer welcomed the interviewees and addressed aspects that he enjoyed about the interviewees' latest competitive matches (e.g., "Thank you for meeting with me today. I enjoyed watching your match the other day..."). Demographic data was captured and audio-recording was started with an inviting open-ended question (i.e., "Can you briefly describe how you came to play LoL in competition?"). Based on the idea of gaining true reflections of interviewees' experiences, interviews lasted an average of 28.77 minutes ( $SD = 6.74$ ). After completion of the interview, interviewees were informed about the underlying research question, and possible coping strategies were discussed.

### ***Interview Guide***

A semi-structured interview guide was constructed for the purpose of this study based on recommendations by Kallio et al. (2016). The semi-structured format allowed the interviewer to be responsive, offered interviewees the opportunity to individually express important aspects, and kept the conversation flowing. The interview guide was developed collaboratively with the research team and was based on consultations with an expert in the area of qualitative research methodology.

The content of the interview guide was primarily based on Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) and cognitive-motivational relational theory of emotions (Lazarus, 1999). Importantly, these theories (Bhaskar, 1979) were supported, modified or rejected to explain the particular experience of the interviewees (Fletcher, 2016). Specifically, the protocol was designed to identify players' experiences related to stressors, perceived stress responses and coping strategies with respect to their best and worst competitions (interview guide: <https://osf.io/e7v8y/>). Inspecting players' best and worst competitions allowed us to include discrepant or negative cases to gain a greater understanding of players' subjective experience (Mays & Pope, 2000). The word stress or perceived pressure was not used by the interviewer (e.g., "Which immediate thoughts and feelings were associated with this competition?" and "What do you think has influenced the outcome of this competition?") to only gain insights on interviewees' prominent experiences. Indeed, interviewees were told that the interviews focused on their subjective experience while playing LoL competitively. After creating a first draft of the interview guide, it was discussed with FL and AME and adjusted accordingly. Then, the interview guide was piloted with one traditional sport athlete and one professional LoL player that met the inclusion criteria for study participation. Using the feedback, one question was changed and concluding questions were added.

### ***Data Analysis***

Following data collection, all audio files were transcribed verbatim. To maintain the anonymity of participants, pseudonyms replaced participants names. In line with our philosophical position,

the analysis was performed according to the main principles of thematic analysis: becoming familiar with the data, coding, generating initial themes, reviewing, defining, and naming themes, and contextualizing the analysis (Braun et al., 2016). Familiarization with the data and initial data analysis took place during data collection to gather more reliable and valid data (Merriam & Tisdell, 2015) using the software MAXQDA Plus 2020. The first author inductively coded on a line-by-line basis with categories emerging from the analysis relating to stressors, perceived stress responses, and coping strategies. Whereas stressors referred to internal and external stimuli that elicited a reaction from players (e.g., high expectancies of self), the way interviewees reacted to stressors was coded as perceived stress responses (e.g., being nervous), and interviewees' description of managing these stressors was coded as coping responses (e.g., self-talk). During this process, the second author acted as a "critical friend". The final codes (i.e., stressors, perceived stress responses, and coping strategies) were extracted by the first author to an Excel spreadsheet. If these were German, they were translated into English by a bilingual researcher. Three researchers independently sorted stressors and coping strategies into tentative categories based on their own reflections to check for selective perception and to illuminate blind spots (i.e., analyst triangulation). Afterwards, tentative categories were discussed by authors OL and PB (Smith & McGannon, 2017) with no major disagreements between the researchers. The final categories were then reviewed and discussed by OL and FL and checked for congruence between existing literature on stress and coping.

## Results

In line with the aims of the study, the findings are presented in three main sections; stressors, perceived stress responses, and coping. Players' names are pseudonyms and quotes translated from German into English are marked with (t).

### *Stressors*

Players described experiencing stressors regarding competition in five main areas. These included performance expectations, internal evaluation, team issues, audience and social media, and environmental constraints.

#### Performance expectations

All professional players acknowledged performance expectations as demands experienced within the competitive environment. The following quote by Michael illustrates players' expectations including the goal of winning and demonstrating high performance:

*"I wanted to be the best there. I wanted to be by far the best. I wanted to dominate. That was what I demanded from myself."*

Beside high self-expectations (n = 5), players described demands such as wanting to play without mistakes (n = 4), win the finals (n = 3), and win for a teammate (n = 1). Illustrating the relevance of performance expectations, Thomas spoke about his dream and its' association with high pressure. Mark talked about different sources of stress that he experiences and summarized the pressure he puts on himself as "the worst". In addition to performance expectations, three players mentioned the pressure of staying focused. They reported putting pressure on themselves to stay

focused during competition. For instance, Daniel described the importance of staying concentrated as follows:

*“During the game you have to be fully concentrated all the time. You cannot lose concentration for a second. It doesn’t have to be bad, but something can happen the second you’re not concentrating and that can cause you to lose the game (t).”*

In contrast, two players said the only pressure they experienced was from themselves when they discussed their best competition.

### Internal Evaluation

Players’ perception of their performance, opponents’ abilities, and outcome of competition have been reported to negatively influence the competitive experience in esports. Among others (n = 3), Thomas discussed being scared of the consequences of losing and how he would feel afterwards. Losing a game also seemed to impact players’ competitive experience (n = 3), as described by Christopher:

*“The pressure on myself was of course much higher after losing the first game (t).”*

Playing against strong opponents or perceiving opponents as the better team was also identified as a stressor (n = 3). For example, Michael perceived the opposing team as a challenge and said:

*“Every time you practice, we saw them and it’s like we have to do better to beat them. It was a challenge and we overcame it”.*

In addition, Mark reported that he did not know how to win against the opposing team and that he did not know what to do during game play.

### Team Issues

Interviewees reported various team-related stressors, including lack of confidence in teammates, intra-team criticism, and teammate evaluation of ones’ performance. In detail, lack of confidence related to performance of teammates such as worry about their skill level (n = 3) is illustrated by Roberts’ quote:

*“The pressure was insane, because I had to always perform and it felt like I had to perform much more than everyone else, because I was on a bad team and I would have to lift the team up. Almost single handle this, so it was a really hard pressure.”*

As this quote demonstrates, lack of confidence in teammates was associated with an increased pressure to perform. In addition, Christopher talked about experiencing bad plays from teammates during game play, which resulted in experiencing more pressure and feeling the need to compensate for his teammates and give everything he had to the game:

*“When I notice it’s not going well at all on bot lane [i.e., location at the map that is played by played by two teammates], then of course, I know that there’s a greater pressure on me as a mid laner, because then I have to put myself in the carry position [i.e., being responsible for winning a game] a bit and try to get more out of it somehow. And I know that I have to play better than would otherwise be necessary. That you really have to give everything now (t).”*



Players also experienced intra-team criticism ( $n = 5$ ). Participants gave examples such as people pointing fingers and criticizing each other. This is illustrated by Mark who shortly described his experience in the following way:

*“People made mistakes, they pointed fingers, the team environment was really toxic”.*

In addition, Michael—who talked about leaving a team due to intra-team criticism—indicates how this can create a highly negative environment that one is relieved to leave:

*“Actually, it was the best thing that happened to me. I was really relieved to be out. I didn’t want to play there. So thank God this happened”.*

Furthermore, two players acknowledged experiencing evaluative pressure from their teammates. This is highlighted in the following quote by David:

*“I mean it was quite intense before, because I felt like I was trying to kind of impress like the coach and Zero [teammates’ name changed] and trying to reach the standards they expected from teammates. So that was quiet a lot of pressure on the team.”*

#### Audience and Social Media

Another stressor described by the players referred to audience and social media. Audience (i.e., online and offline) was described to impact players in different ways. While Steven reported that he could not relax immediately after a competition due to media interviews, John acknowledged that he experienced great pressure from the live-audience prior to competition. However, two players also referred to this stressor as something positive, including Robert who acknowledged that live-audience pressure made him perform better:

*“The moment you realize there are so many people watching you, you know it’s real. It puts more pressure on you, but it put the pressure on me, it wasn’t like a pressure that makes you not perform, but it was a pressure that made me perform. That made me give my best, so it motivated me - insanely.”*

Another aspect that was discussed by four players was being the favorite team and the attention that they received from the live-audience and via social media. David reflected on this stressor as a source of pressure to win:

*“I think that was probably the tournament where I had the most pressure to win. Because in other tournaments I have been in, there have always been more than one favorite. But this one, we were literally the only good team at the tournament. We were the only official team. The rest of the teams were just random friends. Yeah. Everyone didn’t care if we won. But everyone would immediately notice if we lost.”*

In addition, multiple players acknowledged pressure from social media ( $n = 4$ ) and one player reported pressure from media interviews ( $n = 1$ ). For example, John acknowledged social media comments that caused him to feel bad about mistakes he made during competition. In contrast, pressure from social media was also perceived as motivating as reported by Robert, who became motivated to disprove social media statements that he is “overrated”.

### Environmental Constraints

Environmental constraints were another stressor highlighted by players during interviews. For example, Steven reported jetlag as a stressor because of an offline competition that took place in another country. Another environmental stressor reported by the professional players was related to perceived pressure from the organizational ( $n = 2$ ) and competitive setting ( $n = 1$ ). For instance, John said he is more nervous in online than in offline events. However, he could not explain why. One player added the lack of training hours as a stressor he experienced. In addition, two players reported that a stressor faced in competitive settings was an unprofessional environment (e.g., having no coach or manager). Robert described being isolated:

*“This season I was on my own completely, no one took care of me, no one was helping me out, no one was there to hold me when I needed to, no one was supporting me. It was just basically that I was on my own. We had no coach, we had no manager, we had to do everything ourselves. I had to do everything myself.”*

### **Perceived Stress Responses**

Stress responses acknowledged by interviewees were most prominent prior to and after competition. Participants expressed being excited, anxious, nervous, tired, and/or physiologically aroused prior to competition. For instance, John reported sweating, stuttering, and shaking before competition, whereas Robert described his response in the following way:

*“Strangely stressed and excited for it. It was not like I was shaking and not be able to do stuff. I felt like I am more aware of my surroundings and more in the moment than when I was competing normally. I was more aware of myself and everything around so, yeah. It’s like, you know if I would be in a danger mode, for example, it doesn’t happen now but if I would be in the wilderness I would look around and see everything”*

In general, the players spoke about reactions being most prominent prior to competition and then decreasing after the first minutes of game play. The following quote by Steven illustrates the perception of heart rate during competition:

*“During game play you automatically slow down. Heart rate doesn’t go much further, that’s not possibly any more. Heart rate is the highest before the game and then somehow in the game it goes down again (t).”*

This is similar to other responses acknowledged by players such as feeling hungry or helpless, having tunnel vision, or experiencing an increased heart rate. For example, Thomas said he experiences hunger between games, but not during game play, because of being focused on game play. Players rarely reported the experience of responses (e.g., heart rate and nervousness) during game play. With regard to nervousness, John said:

*“So in the game it’s like that, mostly for me, I’m nervous just before the game and then, when the game starts, two or three minutes when you’re in the game, then it all goes away. Then I’m not nervous at all anymore, then I just play the game (t).”*

Players also acknowledged that responses after competition are dependent on the outcome of competition and ones' impact on this outcome. While players' best competitions were primarily associated with happiness, exhaustion, and feeling good, players' worst competitions were associated with anger, sadness, disappointment, and feeling bad. For example, Mark described the responses after his best competition as follows:

*“And I remember that was one of the happiest moments. I think I was really happy. I took off my headphones and was like “yes” (shouting). I remember feeling so overwhelmed by emotions, because I was so happy to win that game.”*

Conversely, Mark's responses after losing his perceived worst competition of his career were as follows:

*“And after the game ended, I felt so embarrassed. I don't know why, I felt really embarrassed. I have never been so humiliated in the game you know. They made fun of us. That was the feeling we had”.*

### **Coping Strategies**

Professional players reported a range of coping strategies that were categorized into six themes: social network, attention regulation, self-regulation, increasing effort, consumption strategies, and dissociation.

#### Social Network

As illustrated by the following quote by Robert, the team environment can play a significant role in the use of coping strategies:

*“Funnily enough, with pressure the team environment helps the most. Because if you have a good team environment, then the pressure doesn't even get you, you don't even feel it. Cause you joke around, do stuff together, you're friends and you don't even notice the outs. You live in your bubble and you don't care about the pressure from outside, or the comments or anything. If you don't have that, it starts getting in when you hear the criticism. Basically, the team environment works for pressure.”*

In addition, participants described a range of coping strategies relating to communication. Whereas David discussed matters relating to expectations with his coach, Mark summarized the use of communication as follows:

*“Talking about what you feel, that's also the main thing to cope with anything. If you talk about it, it always becomes easier.”*

Beside communicating with coaches (n = 2), players acknowledged talking to teammates (n = 4), girlfriend, friends, as well as family (n = 1). In addition to communicating with others, players also mentioned strategies such as trusting coaching staff (n = 1), spending time with friends (n = 1), and relying on teammate support (n = 1).

#### Attention Regulation

During competition, eight players mentioned frequently using strategies such as adjusting focus on the game, when they made mistakes. Michael referred to this in the following way:

*“During the tournament. Honestly, right there, I was just focusing on performing you know, that’s all that matters.”*

Other strategies included focusing on the next game or focusing on themselves, as illustrated by the following quote of Robert:

*“At first I was focusing at lot on the team and winning, playing correctly with the team, but then, when I lost motivation I had to start focusing on myself and basically, even though my teammates underperformed I had to figure out myself how to play in that situation, not give up, and always try to win rather than just playing and looking good.”*

### Self-regulation

Beside attentional regulation, professional players employed a variety of self-regulation strategies such as using sleep (n = 1), meditation (n = 1), self-talk (n = 1), cold showers (n = 2), and partying (n = 2) to regulate pressure from the competitive environment. For instance, when John acknowledged performance pressure and pressure from social media, he discussed a routine he has followed for a while:

*“Lately, I have started about an hour before the game, I have a ball and I play around with it a bit. I toss it up, I throw it against the wall, I walk around in my room a bit. Do a little sport about 15 minutes with the ball and then I go and take a cold shower. After the cold shower I lie down in my bed and breathe in and out consciously for a minute, and then I get a little nervous, but I hardly notice it (t).”*

In addition, two players spoke about visualizing game play prior to competition as illustrated by Michael:

*“I was thinking about how to play the map correctly and I was visualizing the processes you need to perform in the game, and when I was on stage it was like autopilot. I knew what I had to do and it all worked out.”*

Three players also highlighted physical exercise as a strategy to deal with pressure or frustration after performance. Mark said that physical exercise is: “one of the best things to actually cope with stress”.

### Increasing Effort

Players also reported increasing their efforts to cope with stressors of the competitive environment. John’s quote illustrates how players usually cope with stressful situations during competition:

*“I felt this pressure to perform just before the game and just after the game started: I felt all this. But then after two or three minutes, it was gone and I was able to focus completely on the game and then I didn’t think about what was going on, about how many people were watching, what pressure I’m under, but I am just thinking in that moment OK, I am playing as good as I can now. In LoL it is*

*like that: you try to do your best in the third, in the fourth, in the fifth minute and you are not thinking about what pressure you're under. You don't think about that until after (t)."*

Players also used other coping strategies such as watching good players ( $n = 1$ ), analyzing games ( $n = 1$ ), and evaluating losses ( $n = 1$ ). For example, Michael re-evaluated his losses when he was confronted with intra-team criticism by considering what he needs to do better when he was not performing well. When Thomas was asked how he tried to cope with being frustrated after losing the game, he talked about "practicing like crazy".

### Consumption Strategies

Players reportedly used drinks, nutrition, and substances to regulate stress. For example, two participants discussed drinking coffee and/or energy drinks prior to competition to combat feeling tired. To cope with the pressure of staying focused and maintaining performance, Robert acknowledged nutrition as a significant aspect:

*"I don't eat sugar all day. I stay away from it. I drink a lot of water. I found that if you basically drink a lot more water, for example, when I drink one liter of water a day or when I drink 3 liters a day I have higher performance. It's like my focus is higher, my reaction timers are smaller or faster."*

Whereas two players acknowledged eating fruits between games to meet the competitive demands of staying focused, two players reported to smoke or drink alcohol to cope with an unfavorable outcome as illustrated in the following quote by Steven:

*"Normally it's really like that after every tournament, where you don't get the result you want, you go out and celebrate, it's always called resetting memory. So you drink. You have a relatively unhealthy relationship with alcohol. That's just one of the ways of dealing with it (t)."*

### Dissociation

Professional players also used strategies to avoid pressure such as behavioral or cognitive distancing, primarily during competition. Specifically, they played passively to avoid making mistakes ( $n = 1$ ), avoided thinking about the mistake ( $n = 3$ ) or stopped talking to teammates ( $n = 3$ ). Steven summarized his experience of using dissociation as follows:

*"In the game you don't have time for that, you have to suppress that and push it far away from you, because it affects you, and you can't go on playing, then you would almost shake and think of certain things."*

## **Discussion**

The aim of the present qualitative study was to provide new insights into stressor, perceived stress responses, and coping strategies experienced by professional LoL players.

### **Stressors**

A variety of stressors were reported that were most prevalent before and after competition. Performance expectations, internal evaluation, team issues, as well as audience and social media were the most frequently discussed stressors. Performance and team environment have been reported as stressors in previous studies for sport performers (e.g., cricket: McCreary et al., 2020;

sport performers: Sarkar & Fletcher, 2014; tennis: Swettenham et al., 2020) and esports players (e.g., LoL: Himmelstein et al., 2017; LoL: Kou & Gui, 2020; CS:GO: Smith et al., 2019). For instance, Smith and colleagues (2019) reported team issues (e.g., communication issues and intra-team criticism), external criticism (e.g., social media), and performance-related stressors (e.g., outcomes of losing) in professional CS:GO players. Given that players perform primarily within an online based environment with competition being live-streamed and commented, social media could be particularly important in esports. Although research in traditional sports has highlighted the importance of social media for athletes (e.g., David et al., 2018; Lim et al., 2020), studies examining the relationship between social media and sport performance are limited (Filo et al., 2015). Whereas social media seems to be related to, for example, motivation and mood management (Braunmüller, 2020; Hayes et al., 2019), studies have indicated a relationship between social media and lower performance levels among athletes (David et al., 2018; Encel et al., 2017; Jones et al., 2019). Future studies are warranted to investigate stressors relating to social media, their impact on players, interactions with cognitive appraisal (e.g., challenge vs. threat) as well their impact on coping strategies used and their respective efficacy.

### ***Perceived Stress Responses***

Players acknowledged various stress responses before competition such as anxiety, nervousness, excitement and activation of the autonomic nervous system. Prior research has suggested that pleasant emotions (e.g., excitement) are related to higher levels of performance, while unpleasant emotions (e.g., anxiety) are related to lower levels of performance (Campo et al., 2019; Martinent & Ferrand, 2015; Rathschlag & Memmert, 2015). In addition, research has highlighted the impact of the neurohormonal (Paridon et al., 2017) and autonomic nervous system (Abad-Tortosa et al., 2017) activation on performance. For instance, an anticipatory cortisol response before competition is suggested to impact sport performance through its influence on cognitive processes (Bishop et al., 2004; Dedovic et al., 2009). According to research on traditional athletes, esports players would benefit from increased education regarding optimal pre-performance states (e.g., positive emotions: Behnke et al., 2021).

Conversely, the interviewees' perceived stress responses seem to be suppressed during competition. Given that players can only have a limited amount of information in their working memory (Fougnie, 2008), focusing on task-relevant stimuli might cause players to be distracted from experiencing stress responses such as increased heart rate. This assumption is supported by the coping strategy of focusing on performance during gameplay as reported by the majority of players in the present study.

After competition, responses were related to the outcome of competition. While players' best competitions were related to happiness, exhaustion, and feeling good, players' worst competitions were related to sadness, disappointment, and feeling bad. Although in line with theory (Lazarus, 1999) and previous research in non-esports athletes (e.g., table tennis: Martinent & Ferrand, 2015; cricket: Neil et al., 2016; international athletes: Uphill & Jones, 2007), knowledge of stress in specific competitive esports settings is limited (see review by Leis & Lautenbach, 2020). Therefore, it is challenging to conduct valid comparisons in the literature. Nonetheless, studies support the experiences of players in the present study by indicating that emotional responses are related to factors such as performance (Behnke & Kaczmarek, 2018; LoL: Kou & Gui, 2020; cricket: Neil et al., 2016). Specifically, Behnke et al. (2021) found that underperforming was related to anger and sadness, whereas successful performance was associated with enthusiasm and amusement. In

addition, positively balanced emotions (e.g., happiness) were also most frequently acknowledged after a favorable outcome, whereas negatively valanced emotions (e.g., sadness) were most frequently acknowledged after an unfavorable outcome (Nicholls et al., 2010; Wilson & Kerr, 1999).

Overall, players experienced a connection between their stress responses and performance. However, more research is needed that investigates associated subjective and objective stress responses related to esports competition (e.g., Leis & Lautenbach, 2020) and the emotions-performance-relationship (Behnke et al., 2020) to inform future interventions strategies.

### ***Coping Strategies***

A variety of coping strategies used by professional esports players were identified. Whereas communication was most frequently used by players before and after competition, focusing on performance was the main strategy players employed during competition. Overall, these findings are in line with previous evidence on coping strategies in competitive sport contexts (Nicholls & Polman, 2007). For instance, the relevance of social networking was also acknowledged by professional traditional athletes to deal with stressors during competition (e.g., team sports: LePrince et al., 2018; in captains: Weston et al., 2009). Coping strategies during performance, such as focusing on performance are frequently used by sports players (e.g., rugby: Nicholls et al., 2006, 2009; golf: Nicholls et al., 2010; tennis: Swettenham et al., 2020). In addition, strategies applied before, during, and after competition highlight that coping changes during different phases of competition as reported in previous studies (Nicholls & Polman, 2007).

Similar coping strategies were also reported in previous studies with esports players (LoL: Kou & Gui, 2020; CS:GO: Smith et al., 2019) such as communication and focusing on game play. In addition, both professional LoL players and CS:GO players in Smith et al.'s (2019) study seem to apply avoidance coping strategies (e.g., not playing aggressively) during competition. Furthermore, the present study supports techniques for successful performance as identified by Himmelstein and colleagues (2017), including communication, staying in the moment, and building team dynamics.

In contrast to previous studies, professional LoL players have also reported using nutrition such as caffeine to cope with the demands of the competitive environment. While a recent review has suggested that caffeine can improve self-reported energy, mood, and cognitive functions such as attention and reaction time (Lorenzo Calvo et al., 2021), future research is needed to investigate this aspect in esports and provide insights into related (positive and negative) effects on performance.

### ***Practical Implications***

Several implications arise as a result of this study. Discussing possible stressors, perceived stress responses, and coping strategies might help players recognize these and adapt them if necessary. As recently argued by Smith and colleagues (2019), applied practitioners are encouraged to assess current psychological skill usage in esports and align training to the specific esports demands. In doing so, practitioners (i.e., sport psychologists and performance coaches) should be aware of their function and frequently exchange information within confidentiality limits (Watson et al.,

2021). Given the identified team issues (e.g., intra-team criticism) as well as applied coping strategies (e.g., communication), esports teams might benefit from interventions designed to build trust and communication, and in turn, overall team functioning. This is supported by previous evidence highlighting esports players' particular needs to coordinate team activities under pressure and maintain communication patterns (Freeman & Wuhn, 2019; Himmelstein et al., 2017). Performance coaches may focus on coordinating and optimizing group activities (e.g., reviewing games and training sessions), while sport psychologists may provide sport psychological support for teams (e.g., team building) and organizations (Watson et al., 2021). Based on the coping strategies highlighted in the present study, it also seems appropriate for performance coaches to share general information about sports nutrition and support professional players by providing personal training (Watson et al., 2021). Since all players in this study experience performance pressure, emotional regulation strategies such as breathing techniques (Laborde et al., 2021) and self-talk (Hatzigeorgiadis et al., 2014) could be effective methods to support players. Importantly, intervention strategies need to be tailored to individual players (Cottrell et al., 2018) and involve their environment (e.g., coaches, parents) to influence their development, individual and team performance (Henriksen et al., 2014). In general, delivering sport psychological training or support should focus on long-term strategies to enhance success. Since esports is currently defined by quick and constant changes in teams, members and coaching staff, different ways of delivering support strategies need to be explored.

### ***Future Research***

While this study provided first insights into stress and coping in professional LoL players, a greater understanding of psychological stress and coping strategies in esports is necessary to inform psychological intervention strategies in the future (Leis & Lautenbach, 2020). To achieve this understanding, studies should investigate the effects of the identified stressors and individual and interpersonal coping strategies on stress and performance. Qualitative approaches such as diary methods and thinking aloud protocols could develop a greater understanding of these aspects (Didymus et al., 2021). In addition, future research could also examine the relationship between factors such as age and experience on professional player's ability to cope and manage stressors. To achieve a more holistic understanding of the stress-performance relationship (in LoL) and provide specific psychological interventions, it is necessary to also investigate stress and coping in non-competitive settings (e.g., training and off-season). Evidence on organizational stressors (e.g., travel and training environment) and personal stressors (e.g., career development and work-life balance) would benefit the information of psychological interventions. In addition to research on coping strategies used by professional players, research on stress management strategies currently used by sport psychologists and performance coaches in esports could inform strategies used in future intervention studies based on a more holistic body of research.

### ***Limitations***

The current study on psychological stress in esports has several limitations that must be considered in future studies. Since the interview guide focused on stressors, coping, and perceived stress responses related to competition, professional players might experience additional stressors, perceived stress responses and apply different coping strategies in non-competitive settings such as in training and off-season (e.g., Smith et al., 2019). Studies in traditional sports (McCormick et al., 2018; Nicholls et al., 2010) and esports (Himmelstein et al., 2017; Smith et al.,



2019) also reported individual issues such as game–life balance (e.g., managing practice schedule) and difficulty managing lifestyle (e.g., cost and time-related burden of travel), which were seldom discussed in this present study. In addition, asking interviewees directly about stress, stressors, or perceived pressure might have resulted in different results and an enhanced interview duration. However, this non-judgmental approach was used to capture participants' actual experience of the competitive environment. In a similar vein, a prolonged qualitative approach (i.e., spending extended time with interviewees during their competitive season—including reflective journals before and after competition)—might lead to an enhanced understanding of stressors, perceived stress responses, and coping in esports across different facets of gameplay. Furthermore, we acknowledge that the results only address male players. Although this reflects the current demographic situation among professional LoL players, future studies might also address stressors, perceived stress responses and coping strategies in professional female players. Finally, the findings of the present study may constitute a type of naturalistic generalizability (Stake, 1995) since they might resonate with the readers personal experiences of stressors, perceived stress responses, and coping strategies in professional players. Therefore, the extent to which the results can be generalized is dependent on the readers' experiences. Accordingly, esports players from different games (e.g., CS:GO and FIFA) might recognize similarities and differences with the findings (Smith et al., 2019).

## Conclusion

The current study provides insights into a variety of stressors, perceived stress responses, and coping strategies of professional LoL players. In addition to previous studies on psychological stress in traditional sports competition, professional esports players reported social media as a stressor. Furthermore, players reported coping strategies such as drinking coffee before competition or eat fruits between games to combat feeling tired. However, more research is needed to understand the impact of reported stressors and coping strategies on esports players, both in terms of performance and overall mental well-being. Finally, results of the present study suggest that players should systematically learn how to recognize and regulate associated stress responses.

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