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Experiences of Choke Among Professional and Amateur Esports Players: A Qualitative Investigation

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Abstract

Esports frequently invoke high-pressure circumstances in which player performance is crucial; in these contexts, moments of critical underperformance ('choke') can have deleterious consequences for the underperforming player or team. In this research, we employ comprehensive qualitative methodologies (interview and survey) to investigate the antecedents to, and underpinnings of, choke experienced by both amateur and professional esports players. Using reflexive thematic analysis, we identify both commonalities and differences in the experience of choke across both groups. Both amateur and professional esports players report *Nervous Activation* and *Overconfidence* mental states prior to a choke episode, and cite pressures such as *Stakes* and *Spectator Pressure*. In contrast, professional players alone report pressures such as *Team*, *Stage*, *Reputation*, *Rival*, and *Sexism* pressures, whereas amateurs alone cite *Lack of Focus*, *Frustration* and *Underconfidence* mental states. Finally, when recalling an episode of choke, amateur players experience more mechanically-driven performance failures, whereas professional players report strategic failures. We propose that these findings contribute to a more complete understanding of performance amongst both professional and amateur players of esports titles, and can be employed to scaffold and support performance in high-pressure gaming contexts.

Keywords: esports, professionals, amateurs, choke, performance, qualitative

Highlights:

- The antecedents and underpinnings of choke differ among amateur and professional esports players.
- Amateur and professional esports players share mental states (i.e., *Nervous Activation* and *Overconfidence*) and pressures (i.e., *Stakes Pressure* and *Spectator Pressure*) in relation to a choke event.
- Both amateur and professional esports players report unique mental states and pressures immediately prior to or following a choke event; amateurs cite *Lack of Focus*, *Frustration*,

and *Underconfidence* (mental states) and *Social Pressure* and *Distractions and Detractors*, whereas professionals describe pressures related to *Team Pressure*, *Stage Pressure*, *Reputation Pressure*, *Rival Pressure*, and *Sexism*.

- Amateur players experience more *Mechanical Choke* performance failures, while professional players describe more instances of *Strategic Choke*.

Introduction

Competitive video games create high-pressure scenarios. Maintaining consistent performance in these scenarios is critical for both professional and amateur esports players: professional players' performance is directly connected to employment, status, reputation, team synergy, and the outcomes of tournaments with often significant prize pools; in contrast, amateur players' ability to reliably meet challenges set by a game is tied to enjoyment of the game and continued motivation to play (Fong et al., 2014).

A failure to maintain this performance, specifically in a situation where it is expected or highly important, is recognised in sports literature as 'choke' (Baumeister, 1984). Despite this, the term has largely only enjoyed colloquial use in video gaming. Although endemic in competitive video game play, there is a lack of empirical research exploring the concept of video game choke in the context of esports—a domain that lends itself readily to opportunities for choke events. How and why choke *manifests* may differ depending on player contexts. In particular, owing to the polarity in stakes, supports, and pressures faced by amateur and professional players, it is possible that the antecedents to choke (that is, factors that trigger a choke episode), and the underpinning mechanisms of the choke episode itself, may also manifest differently between these populations.

High-level performance and expertise development among esports players has been identified as a critical topic of inquiry in esports research. Within this domain, researchers have investigated the mental skills of esports players (Himmelstein et al., 2017), the stressors experienced by esports players (Poulus & Coulter, 2021; Poulus et al., 2022a; Poulus et al., 2022b; Smith et al., 2019; Leis et al., 2022; Leis & Lautenbach, 2020), how esports players cope under pressure (Poulus et al., 2020; Smith et al., 2019; Kou & Gui, 2020), and how performance differs across varying levels of expertise (Bickmann et al., 2021; Velichkovsky et al., 2019; Khromov et al., 2019). However, further research investigating performance under pressure, particularly during critical moments of play (i.e., choke), is required to better understand the mechanisms underpinning a choke episode—thus equipping scholars and teams with the tools and knowledge required for choke prevention and stress management.

It is critical to understand how choke manifests amongst both amateur and professional players because the experiences and successes of both groups are essential to the sustainability of esports. The performance and wellbeing of professional players is both key to organisational and team success, as well as consumer engagement; conversely, the maintenance of satisfactory performance represents a vital component of an amateur player's ongoing enjoyment of a game, as decreased performance and self-efficacy are associated with decreased motivation to play (Klimmt & Hartmann, 2006). As the context of professional and amateur players' experiences differ in multiple dimensions, it is important that we understand both these populations and do not erroneously generalise one groups' experiences to that of the other.

Comparisons between experts and amateurs can provide useful insights into how to aid amateurs in developing more expert-like behaviours and thinking. Previous literature has examined differences between professionals and non-professionals in terms of markers for performance (e.g., gaze behaviours, reaction time) (Bickmann et al., 2020; Khromov et al., 2019; Velichkovsky et al., 2019), physiological responses to stress (Pedraza-Ramirez et al., 2020), mental toughness (Poulus et al., 2020), and motivations to play (Garcia-Lanzo & Chamarro, 2018). Exploring these

differences provides insights into how to support players at differing levels of expertise in their pursuit of mastery. As professional players are generally more motivated to maintain performance, they experience higher cortisol levels, cognitive anxiety, and perceived match importance prior to competition than amateur players (Mendoza et al., 2021)—however, limited research has conducted expert-amateur comparisons exploring player experiences of choke. In previous work, we found that less game experience was associated with a greater propensity to choke, while more experience was associated with a greater propensity to clutch (Beres et al., 2021).

Taken together, these studies highlight that all players experience a myriad of stressors under high-pressure. However, such studies do not explicitly investigate these phenomena among expert and amateur players during episodes of choke. To this end, we conduct a qualitative analysis of a mixed-methods study to gain an in-depth understanding of how players at varying levels of expertise experience episodes of choke during competition at both an individual and team level.

This research seeks to address gaps in the literature, by investigating how choke episodes are elicited and how choke manifests. To this end, we generated two primary research questions:

- RQ1. What are the factors that elicit choke events in competitive multiplayer video games?
    - RQ1a. Are there any differences in the factors that lead to choke in professional contexts compared to amateur play?
- RQ2. How do performance failures manifest during a choke event?
    - RQ2a. Are there any differences in how esports professionals experience choke compared to amateurs?

Methodology

Amateur Players

In the context of this study, we define 'amateurs' as those who have a preference for and experience playing competitive multiplayer video games; however, have not competed in leagues, sponsored teams, or bracketed tournaments. In contrast, we define 'professionals' as those who have competed either as 'professional' or 'semi-professional' players in leagues, sponsored teams, and bracketed tournaments in competitive multiplayer video games.

Procedure

To explore the experience of choke among amateur players, we deployed a survey on MTurk through the Human Intelligence Task (HIT) interface. Upon accessing the HIT, participants were provided a consent form which outlined the purpose of the study, its potential risks and benefits, anonymity procedures, and participants' right to withdraw. After providing informed consent, participants answered questionnaires about their demographics (e.g., age, gender, nationality, and racial/ethnic identity), gaming preferences and history, experience with esports or competitive gaming, as well as trait inventories (beyond the scope of this manuscript). Participants were then asked to recall a scenario in which they choked, to identify factors they believed led to this specific choke event, and to identify factors they believed to be responsible for choking in general. Alongside the scenario prompt, participants were provided a definition for choking to ensure understanding of the terms. This definition, adapted from sports literature on

performance under pressure (Baumeister, 1984), was as follows: *'Choking' is a term used to describe a scenario in which a player fails to maintain their performance in a situation where it is expected or highly important*. Following completion of the survey, participants were debriefed, thanked, and compensated for their participation. Ethics approval was obtained from the authors' University, and participants were compensated $6 USD; the study took approximately 30 minutes to complete.

Participants

Of the full sample of 210 participants, 28 participants were excluded from analysis due to obstacles in interpretation (e.g., language barriers rendering it difficult to interpret statements without significant rater assumption), and a further 35 were excluded for not matching the sample selection criteria. Themes are generated from the remaining sample of 147 participants (men=99, women=47, non-binary=1) aged 18 to 59 (*Mean*=33.6, *Median*=32.0 *SD*=8.2). Amateur participants reflected on experiences from a total of 54 unique games and game franchises of these, the five most popular games reported included the *Call of Duty* franchise (20), the *Counter-Strike* franchise (13), *Fortnite* (10), *World of Warcraft* (9), and *League of Legends* (8).

Analysis

We conducted an inductive thematic analysis following Braun and Clarke (2006) on the experiences of amateur players. The objective of the thematic analysis was to identify themes in the experience of failure of performance under pressure. To this end, we were interested in both *representative themes* (e.g., what are the components of a choke event?) and *facilitative themes* (e.g., what are the factors that precipitate choking?). In order to ensure satisfactory agreement between raters, both the first and last author undertook an initial coding of 10% of the data to independently identify consistent themes; following this, both authors reviewed the initial themes and developed a coding structure. Both authors then re-coded the same 10% sample with the final set of themes. Following this, as well as additional discussion and minor refinement to ensure mutual understanding of all themes, authors independently coded one half of the full dataset each (including a third re-coding of the initial 10% sample). The full set of data was coded to the established themes using a constant comparative analysis approach (Braun & Clarke, 2006), with both latent and semantic codes. The final themes were not exclusive, as codes could contribute to multiple themes simultaneously. Included were themes that surpassed a lower theme saturation threshold of 10%.

Professional Players

We used a qualitative approach to explore the concept of choke in high-level competitive play within multiplayer-online-battlefield-arena (MOBA) and first-person shooter (FPS) gaming contexts. Owing to the relative inaccessibility of professional players in comparison to amateur players (thus reducing the efficacy of a survey approach), we employed semi-structured interviews that were conducted from the position of critical realism—i.e., an approach that helps explain how and why phenomena occur through observable experiences (Bhaskar & Bhaskar, 1979). In line with a critical realist approach, we interviewed participants with professional gaming experience to gain rich descriptive data on the subjective experiences of professional players within competitive high-level play. The interview guide and survey questions were underpinned with similar epistemologies, allowing for meaningful comparisons between amateur and professional players (Clarke et al., 2015). We used purposeful sampling to recruit participants with professional or semi-professional gaming experience through contacting various collegiate and professional esports teams and organisations worldwide. The study received ethical approval from

the authors' University, and informed consent was obtained from participants prior to conducting the interviews via Zoom. Before the interview, participants completed a survey including questions concerning their demographics and gaming experience. During each interview, the researchers followed an interview guide constructed to gain insight into our two primary research questions, which included rapport-building introductory questions regarding gaming background, followed by the main line of questioning. Open-ended questions were asked to capture participant's experiences of choke, while follow-up probes were used to gain more insight into the details of their experiences. The interview questions were developed with the intent to capture participant's experiences of choke, and were adjusted accordingly following expert discussion. To answer RQ1, we asked participants questions such as "*In general, are there any factors or pressures that you feel may lead up to choking?*", "*What were your feelings/mental state leading up to the choke?*", and "*How did you feel during the choke, and then how did you feel after the choke?*". To answer RQ2, participants were asked the following questions: "*Could you please describe a time you choked in a video game (FPS or MOBA)?*" and "*How was your performance affected for the rest of the match/round or game after you choked?*". The interviews were recorded for transcription purposes and lasted an average of 53.56 minutes (*SD*=16.17), indicating deep engagement from participants in the interview questions.

Participants

Participants (*N*=10) were either professional or semi-professional esports players (9 men, 1 woman) aged 18-33 years (*Mean*=24.1, *SD*=5.02). The sample consisted of 5 FPS players (1 *Rainbow 6: Siege*, 2 *Counter-Strike: Global Offensive*, and 2 *Overwatch*) and 5 MOBA players (5 *League of Legends*). Participants identified as American (60%), Australian (30%) and Chinese (10%). Participants had extensive experience playing competitive multiplayer video games (*Mean*=9.7 years, *SD*=4.06) and reported playing an average of 28.9 hours per week (*SD*=22.16).

Analysis

We used a reflexive thematic analysis (RTA) approach, guided by Braun and Clarke (2006), to gain rich insight into professional esports players' experiences of choke in high-level play. It is important to note that this model is not linear; as such, we revisited phases multiple times throughout the process. The first phase, 'Familiarisation', began with verbatim transcription of the data, carried out by the lead author, which were read and re-read. The following phases, 'Coding', 'Theme Development', and 'Refinement', were carried out in NVivo 12. The first and second authors independently coded 50% of the data to develop an initial set of codes. Next, the authors engaged in constant comparison and expert discussion to develop a final coding structure. A set of themes (including both latent and semantic codes) were developed to capture the essence of participants' experiences of choke, with sub-themes articulating the nuances and details underpinning each theme. The final set of themes were those that surpassed a threshold of ≥40% (with the exception of '*Sexism*'). Despite not reaching our saturation threshold, we included '*Sexism*' (10%) as we suspect that its low saturation was potentially the result of an imbalanced gender ratio, and that this theme would likely reach our threshold if we were able to include more women in our sample (we suggest that the difficulty of recruiting professional women to participate should not obfuscate their experiences). Interview participants' identities have been anonymised, with quotes ascribed to consistent first name pseudonyms.

Results

In our analysis, we identified two prominent antecedents to a choke event amongst both amateur and professional players: the player's mental state, and the pressures immediately preceding, or during, the failure of performance. While both antecedents could be informed by one another (for example, a '*Nervous Activation*' mental state could be induced or enhanced by '*Stage Pressure*'), they could also occur independently of one another (e.g., an '*Overconfident*' mental state may be driven by egoism, rather than any extant pressure). Furthermore, while both antecedents could occur in tandem, either antecedent may independently incur a critical failure in performance - identified in this analysis as the nexus of a choke event. To aid in distinguishing between '*Pressures*' and '*Mental States'*, we consider the externality or internality of their source: '*Pressures*' represent an underperformance induction that exists *externally* to the player (e.g., spectators, or uncomfortable stage lights), whereas '*Mental States*' represent the cognitive and emotional states capable of inducing underperformance that are *internal* to the player (e.g., nervousness).

Below, we report the individual themes identified in both the '*Mental State*' and '*Pressures*' choke antecedent (grouped as 'Facilitative Themes'). We also discuss the individual themes identified in the event of the failure of performance, exploring how a choke episode manifests (groups as 'Representative Themes').

Facilitative Themes

In this section, we explore RQ1: "*What are the factors that elicit choke events in competitive multiplayer video games?*", and conduct a comparative analysis among professional and amateur players to answer RQ1a: "*Are there any differences in the factors that lead to choke in professional contexts compared to amateur play?*". Altogether, the themes generated represent facilitative themes - the factors that precipitate choking.

Mental State

In our analysis, the player's mental state immediately prior to, or during the performance failure, was identified as a prominent antecedent of choke. The player's mental state could be informed by a number of factors, and was often responsive to—or appeared in concert with—pressures (see Figure 1). We characterise a player's mental state as a combination of their *internal* emotional and cognitive processes during or immediately prior to the choke event.

We generated five recurring themes contextualising amateur players' mental states immediately prior to, and during, the choke event - including feelings of *Nervous Activation* (33.33%), a *Lack of Focus* (31.97%), *Overconfidence* (15.65%), *Underconfidence* (11.56%), and *Frustration* (10.88%). These themes are detailed, and supported by participant quotes (original spelling and grammar intact), in Table 1 below.

Themes	Representative quotes	Freq
Nervous Activation ***Composed of feelings of panic, nerves, anxiety, and stress—often elicited under high-pressure.***	*"sometimes when its a high pressure situation nervousness will set in and I start to think too much instead of just using muscle memory and reacting."* (P14) *"...all of a sudden it occurred to me that I needed to keep up this level of performance all night and felt*	33.33%

	anxious I wouldn't be able to do that. This set off a chain reaction in my brain where I started to doubt every move I was making and that crashed my performance overall." (P96)	
Lack of Focus ***A loss of concentration, a disruption in attention, or laziness and tiredness.***	*"...when a critical moment came, I lost focus and made some really dumb moves that ended up costing us the match."* (P209) *"There's also times where I just freeze up because I'm already tilted or I genuinely don't know what to do, almost like an information overload."* (P162) *"...I wasn't focused enough and was chatting with friends while we played."* (P191) *"...being lazy, and trying to take it easy."* (P189) *"being tired..."* (P192)	31.97%
Overconfidence ***Overconfidence, inflated ego, or assurance of victory provoked by either an advantaged game state, underestimation of opponent ability, or by overestimation of one's own ability.***	*"We choked because we got comfortable thinking that our win was secure and didn't think about the other possibilities that could've happened."* (P181) *"I may have been overconfident about my ability to hit the shot."* (P117) *"I was planning ahead and wasn't paying attention to the enemy because he didn't seem too powerful. Unfortunately, I was wrong."* (P96)	15.65%
Underconfidence ***A lack of confidence, low self-esteem, or insecurity—often emerging when playing a game the player was inexperienced in, or when versing opponents the player perceived to be more experienced or skilled.***	*"I was certainly not confident given that I rarely played this game. Also, My competitor was more advanced than me, so maybe my lack of self confidence allowed me to choke."* (P121) *"... [underperformance] comes from being on a losing streak and losing confidence in yourself and playing a bit different from how you normally do."* (P5)	11.56%
Frustration ***Feelings of anger or frustration, typically directed towards the participant themselves, their teammates, or borne out of prior losses or poor performance–often leading to tilt.***	*"It was incredibly frustrating, and I kind of felt helpless towards the end of it like we were going to lose all because of me."* (P128) *"The fumble was unlucky and because of it, I went on tilt, which led to some poor decisions..."* (P109) *"Nothing I did was working. I was pretty annoyed, I kept losing."* (P37) *'The fumble was unlucky and because of it, I went on tilt, which led to some poor decisions..."* (P109) *"Mostly just tilt or built of frustration from the same day. Usually comes from being on a losing streak and losing confidence in yourself and playing a bit different from how you normally do."* (P5)	10.88%

Table 1 - Frequency and Representative Quotes for Amateurs' Self-reported Mental States

We generated two recurring themes detailing pro players' mental states immediately prior to, and during, an episode of choke. These themes include feelings of *Nervous Activation* (90%), and *Overconfidence* (60%)—supported by verbatim participant quotes, represented in Table 2 below.

Themes	Representative quotes	Freq
Nervous Activation ***Composed of feelings of panic, nerves, anxiety, and stress—often elicited under high-pressure.***	*Well, yeah, a lot of the times if I'm like in a choke situation, there's always a sense of like initial panic …"* (Nathan) *"Basically the whole game was on my back, so I was pretty stressed out from basically having to both call the shots in the game and play really well…"* (David)	90%
Overconfidence ***Overconfidence, inflated ego, or assurance of victory provoked by either an advantaged game state, underestimation of opponent ability, or by overestimation of one's own ability.***	*"I think sometimes when you're overconfident, you're likely to make very stupid plays because you're thinking, 'oh, I can out track them,' 'Oh, I can do this.' … But eventually, if you kept doing it, eventually you will get like I guess in quotations we say 'punished."* (Sarah) *"…People either get really cocky and excited to win and they start making overconfident plays. Confidence is a very good thing to have in CS… But overconfidence, there's too much of a good thing…"* (Walter) *"I think people with like flimsy egos tend to choke more is what I've noticed. Like people whose self-confidence is rooted in insecurity…"* (Tristan)	60%

Table 2 - Frequency and Representative Quotes for Professionals' Self-reported Mental States

In comparison to amateur players, professional players reported less variety in mental state leading to a choke event. While both professional and amateur players shared *Nervous Activation* as the most prominent mental state leading to a choke event, and both also reported *Overconfidence*, professional players did not report experiencing the *Underconfidence*, *Frustration*, or *Lack of Focus* described by amateur players.

Pressures

In our analysis, the pressures experienced by the player during gameplay were likewise identified as a prominent antecedent of choke. Pressures could emerge either internally (e.g., emerging from team dynamics) or externally (e.g., being spectated). We define 'pressures' as an underperformance induction that exists *externally* to the player, and often elicited by outcome uncertainty.

We generated four recurring themes contextualising the pressures faced by amateur players during the choke event. These pressures include *Social Pressure* (37.41%), *Spectator Pressure* (19.05%), *Distractions and Detractors* (20.41%) , and *Stakes Pressure* (12.24%). These themes are detailed, and supported by direct participant quotes, in Table 3 below.

Themes	Representative quotes	Freq
Social Pressure *A desire to belong, a sense of responsibility to one's teammates, and reputation concerns.*	*"I felt social pressure to perform well, and felt like I was basically auditioning for a spot in a friend group I wanted to join."* (P96) *"... I feel responsible towards my teammates."* (P124) *"My best friends that i play with are amazing players and competing with them is hard, so i tend to panic when others are doing well."* (P206)	37.41%
Distractions and Detractors *In-game or external elements that distract and detract from gameplay.*	*"hoping you don't disconnect."* (P10) *"...distracted because I had personal problems on my mind relating to my family life."* (P100) *"...thinking about work instead of concentrating on the game."* (P196)	20.41%
Spectator Pressure *The perceived awareness that one's performance is being observed by others.*	*"...I'm pretty self-conscious about looking good and judgement."* (P122) *"I reached a difficult part and suddenly felt like others were watching and judging me. It made me so nervous I had to stop for awhile then felt embarrassed to go back."* (P134) *"People watching me always sets me on edge when I'm trying to focus and succeed."* (P188)	19.05%
Stakes Pressure *Outcome rewards such as prizes (monetary rewards or in-game rewards), prestige, and advancement in rank.*	*"...trying to climb ranks in any online game in ladder matches."* (P17) *"...because there was a big prize for this tournament."* (P39) *"I recently dropped in rank and want to return to my usual spot."* (P15) *"...if you lose you respawn and potentially lose all of your stuff."* (P210)	12.24%

Table 3 - Frequency and Representative Quotes for Amateurs' Self-reported Pressures

We generated seven recurring themes contextualising the pressures faced by professional players during the choke event. These pressures include *Team Pressure* (90%), *Stage Pressure* (90%), *Stakes Pressure* (70%), *Spectator Pressure* (60%), *Reputation Pressure* (40%), *Rival Pressure* (40%), and *Sexism* (10%). These themes are detailed, and supported by direct participant quotes, in Table 4 below.

Themes	Representative quotes	Freq
Team Pressure *A desire not to let the team down, and concerns about poor team synergy*	*"You know you kind of feel bad that you choked because you could have won it for your team. Or maybe it was a really important round. Yeah, and you really needed to win it and you had it. But then you just gave it away and you felt like you, you let down your team and then you kind of feel bad..."* (Sarah) *"...Like I just know that people let their own delusion and ego get in the way of making the best decision. And so, like, I'm just like more aware of that fact now,*	90%

	it's not like that wasn't a thing before. Uhm, I'm just not like deluded into thinking that my teammates are trying to make the best decision that they can…" (Tristan)	
Stage Pressure ***Pressures associated with competing in live LAN environments, such as feelings of being on display, feeling fatigued from the competition format, and difficulties adapting to the unfamiliar or uncomfortable setups.***	*"…I feel like people play worse on LAN, that's just kind of how it works, 'cause with the crowd… there's it's like I said, it's not familiar to a lot of people…"* (Quentin) *"But uh, but like it's definitely like the high pressure on stage, like um tension can be high, like that's where things can crack."* (John) *"…There's difficulty hearing…sometimes I feel like sound, and also not playing on your own set up, kind of makes things funky a little bit"* (Sarah) *"At LAN, there are a strict set of rules you need to follow. You're playing nearly non-stop for hours and hours on end. You're normally playing weird schedules because your schedule is entirely dictated by when another team finishes…"* (Walter)	90%
Stakes Pressure ***Outcome rewards such as prizes (monetary rewards or in-game rewards), prestige, and advancement in rank.***	*"…when you bring some sort of monetary reward in, or really any kind of reward in CS, people play markedly differently, and normally it's not for the better unless they're used to it. Playing for money is something which it takes time to get used to."* (Walter) *"Whereas in a tournament situation. Like there's actual necessity for me to do well… it actually leads to progression into other stages of the tournament…"* (Gary)	70%
Spectator Pressure ***The feeling of being observed, either during live events or on live streaming platforms, by general audience members, fans, and opponents.***	*"I feel like this might be like an individual kind of thing, but I'm kind of a shy person so crowds just automatically get me kind of nervous and I get pressure from that."* (Phineas) *"…Generally streaming on Twitch has always made me play a little bit worse I feel like because, uhm, I get like sometimes negative responses from the people that are in my chat room…"* (Quentin) *"…the crowd kept getting louder and louder as well during that time because there are a lot of [ORG ANONYMISED] fans and not really fans of us. So, over the time it just got really really loud and then actually we were kind of choking in that situation…"* (Quentin) *"The opponents that are not playing at the time are watching you as well…"* (Sarah)	60%
Reputation Pressure	*"There will be times where you expect, like your better players, to pop off, but a lot of the times they feel that*	40%

A desire to uphold one's performance reputation and reassure one's ego.	*pressure and they know that they're the ones that are like supposed to carry."* (Nathan) *"...I'm usually the best player on the team and I'm also the one making all the calls, so if I'm the one who's supposed to be playing the best and making all the calls, and I don't perform and we lose, then it's just on me..."* (David)	
Rival Pressure ***Pressure associated with facing a high-performing rival team or player.***	*"...a player might choke because, and this is a big one, he thinks he's playing people that are better than him marginally or by a large margin, and he thinks he can't compete."* (Walter) *"...Another thing like being on stage, you're against really good opponents usually. So, just thinking about that, like for "okay I'm against a really good player, he's gonna know how to play the game" and like that can affect you already like mentally, just psych you out getting into the game..."* (John)	40%
Sexism ***Gendered discrimination in performance, particularly directed towards women.***	*"...I mean, let's be honest...there's always like discrimination always even now. Like for many years I'm like so used to the hate. Like there's always comments like oh what are you doing? You should be at the kitchen. Or you should make me a sandwich..."* (Sarah) *"...You don't wanna like rebound a nade and like hit yourself or like just you know screw up a nade 'cause everyone would be like "oh my gosh," 'cause there's a stigma that girls aren't good at FPS, there is. There's always, it's always been there. There's a stigma."* (Sarah)	10%

Table 4 - Frequency and Representative Quotes for Professional's Self-reported Pressures

Both professional and amateur players shared *Stakes Pressure* and *Spectator Pressure*, although the significance and context of these pressures differed. Professional players also reported several unique pressures, including *Stage Pressure*, *Team Pressure*, *Reputation Pressure*, and *Rival Pressure*. Likewise, while professional players cited specific pressures related to performing on stage (*Stage Pressure*) and synergizing with teammates (*Team Pressure*), amateur players broadly described pressures related to external or in-game distractions (*Distractions and Detractors*), and appeasing others (*Social Pressure*).

Representative Themes

In this section, we answer RQ2: "*How do performance failures manifest during a choke event?*", and conduct a comparative analysis among professional and amateur players to answer RQ2a: "*Are there any differences in how esports professionals experience choke compared to amateurs?*". Altogether, the themes generated represent representative themes - the factors that represent the components of a choke event.

Performance Failures

Performance Failures represent the crux of the 'choke' event—the moment in which the participant failed to maintain their performance in a situation where it was expected or highly important. Player underperformance emerged as three sub-themes: *Mechanical Choke*, wherein the participant fumbles or misplays their mechanical input; *Strategic Choke*, wherein the participant misreads the situation, or commits to an inappropriate approach; and *Non-Specific Choke*, wherein the participant reports simply having performed "poorly" or having "lost", sans additional detail. These themes are detailed, and supported by direct participant quotes below.

We generated three recurring themes contextualising the crux of the choke event experienced by amateur players. These performance failures include *Non-Specific Choke* (42.18%), *Mechanical Choke* (36.73%), and *Strategic Choke* (27.89%). See Table 5 below for details and representative quotes.

Themes	Representative quotes	Freq
Non-Specific Choke ***General poor or underperformance, either intentionally or unintentionally forgoing specifics related to the underperformance itself.***	*"Nothing I did was working. I was pretty annoyed, I kept losing."* (P37) *"some stupid mistake I wouldn't do otherwise."* (P29) *"The final game to determine the winner was played and I just fell apart."* (P137)	42.18%
Mechanical Choke ***Failure to perform mechanically, wherein players fumbled a discrete—but critical—action or input.***	*"Once I failed to press one button, my ultimate, that does the most damage. My entire team died and we lost."* (P43) *"It was a 1 on 1 in the shooting game and I saw him but I missed every shot. It was a brutal loss."* (P10) *"One time I had an easy shot on the final boss and somehow I missed and caused the mission to end."* (P117)	36.73%
Strategic Choke ***Encapsulates scenarios in which participants failed to recall or commit to a tactic or strategy, were outstrategised by an opponent, or committed to poorly reasoned strategies.***	*"I forgot certain moves and strategies that our team has worked on over the few weeks getting our team together."* (P17) *"[The] opponent took us by surprise and we were left to cover ourselves first and could not think about how to launch a counter attack."* (P48)	27.89%

Table 5 - Frequency and Representative Quotes for Amateurs' Self-reported Performance Failures

We generated three recurring themes contextualising the crux of the choke event experienced by professional players. These performance failures include *Strategic Choke* (80%), *Non-Specific Choke* (60%), and *Mechanical Choke* (40%). See Table 6 below for details and representative quotes.

Themes	Representative quotes	Freq
Strategic Choke ***Encapsulates scenarios in which participants failed to recall or commit to a tactic or strategy, were outstrategised by an***	*"…You were really smart with your plays at the start and you're getting all these kills and you're feeling great and you're feeling so confident, but then eventually you're like ego peeking, and then it doesn't work out for you."* (Sarah)	80%

opponent, or committed to poorly reasoned strategies.	*"...if you lose 3 rounds in a row and people are just shattered, they don't want to play anymore. They think it's hopeless and that impacts their game 'cause they start playing more recklessly. They don't coordinate their, they don't coordinate their pushes and their defenses as well as they could have. They don't use utility properly and things like that."* (Walter)	
Non-Specific Choke ***General poor or underperformance, either intentionally or unintentionally forgoing specifics related to the underperformance itself.***	*"I got 'gapped' by like a really bad player...I don't know, it was strange, but yeah, there was no specific error that I could like point it down to."* (Tristan) *"I did not perform very well. Uh, it just happens. Sometimes you know stars don't align. You do what you can, but you can't do everything."* (Walter)	60%
Mechanical Choke ***Failure to perform mechanically, wherein players fumbled a discrete—but critical—action or input.***	*"...part of it is simply not being well versed enough with what you're doing, maybe you haven't practiced your sprays enough recently. Maybe you haven't practiced your angle prediction enough recently."* (Walter) *"In two maps I made zero frags...yeah, it was just whiffing my shots."* (Gary) *"...you feel like "oh I can't aim anymore," it's like "oh it's gone," like "my mojo's gone." At first you had it and then you don't have it."* (Sarah)	40 %

Table 6 - Frequency and Representative Quotes for Professionals' Self-reported Performance Failures

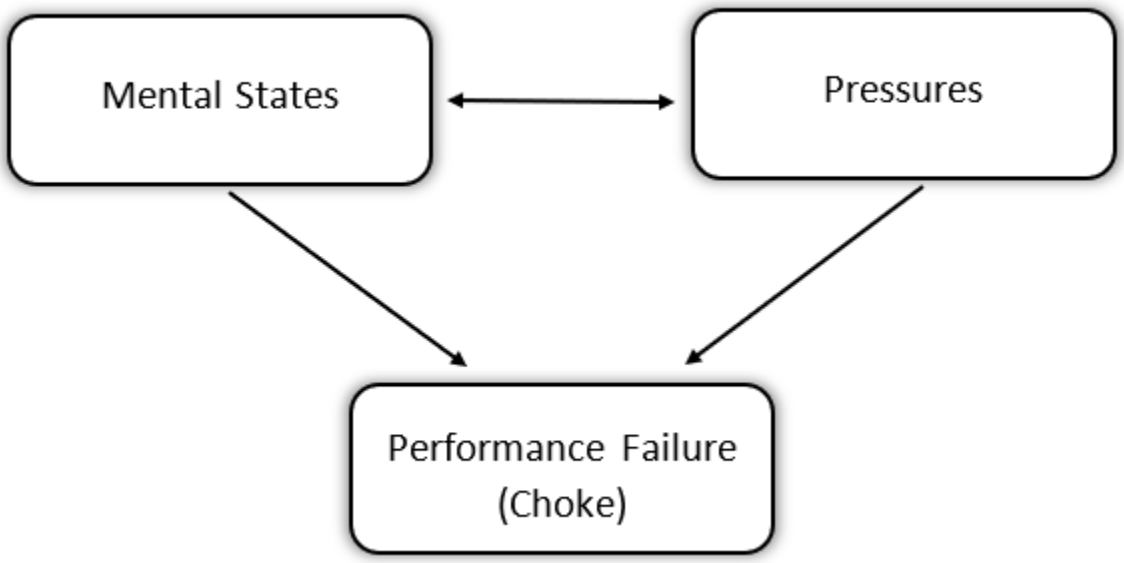

Figure 1. Representation of Mental States and Pressures Interacting to Influence Performance Failures.

While both professional and amateur players shared *Non-Specific Choke, Mechanical Choke, and Strategic Choke*, the prevalence of performance failures differed across levels of expertise. Amateur players reported more instances of *Mechanical Choke*, whereas professional players experienced more instances of *Strategic Choke*.

Discussion

Choking Contributors

To explore RQ1 (*"What are the factors that elicit choke events in competitive multiplayer video games?")* and RQ1a (*"Are there any differences in the factors that lead to choke in professional contexts compared to amateur play?"),* we discuss the themes identified under both *Mental State* and *Pressures*.

Mental State

Both professional and amateur players acknowledged feelings of *Nervous Activation* and *Overconfidence* immediately prior to or during a choke event; however, we identified three additional themes experienced by amateurs alone: *Frustration*, *Underconfidence*, and *Lack of Focus*.

In both groups, *Nervous Activation* was characterised by the presence of panic, nerves, anxiety, and stress—emotions that have been previously identified in performance literature as particularly inductive of low performance (e.g., by prompting nervous players to reinvest in slower, more declarative thought processes (Masters et al., 1993). In sports literature, this state of general anxiety and nervousness associated with competition has been classified as 'competitive state anxiety' (Jones & Swain, 1992), and has likewise been associated with decreased performance among both sports (Lanning & Hisanaga, 1983) and esports (Wang et al., 2022) athletes although this relationship is inconsistent, and potentially dependent upon athletes' ability to internalise or manage anxiety (Craft et al., 2003). While the severity of stakes may differ between amateur and professional players, both groups are subject to a number of pressures capable of inducing anxiety in both amateur or professional contexts

Likewise, both amateur and professional players reported feelings of *Overconfidence* (a mental state characterised by an inflated ego, or by erroneous underestimation of opponent ability) immediately prior to or during a choke event. In contrast, *Underconfidence* (low self-esteem, or overestimation of opponent ability) was identified only among amateur players. We suggest that the shared presence of *Overconfidence* among both amateurs and professionals, but the unique experience of *Underconfidence* to amateurs, may represent their position in competitive gaming: a professional player's positive appraisal of their ability in a game is reinforced by their status as a rostered, salaried, or otherwise sponsored player, who will have needed to be aware of and hone their own abilities in order to achieve this position. In comparison, an amateur player does not possess such tangible evidence of their ability; as such, while they do still experience *Overconfidence*, amateur players seem more prone to self-doubt and negative self-assessment, leading to *Underconfidence*. In performance and psychology literature, low self-efficacy that is, a lack of belief in one's ability to succeed in a task or challenge (Bandura et al, 1999) has been identified as a robust predictor of underperformance in both sports and videogames (Trepte & Reinecke, 2011; Feltz, 2007); as such, its potentiality as an inductor for choke episodes is tenable.

Amateur players reported experiences of *Frustration* (often leading to tilt) immediately prior to, or following an episode of choke. Such emotions may trigger a downward spiral of performance, potentially likewise leading to declarative processing of an otherwise automated task due to increased self-awareness. While professional players did not report *Frustration* as a significant contributor to their choke events, these findings do not suggest that professional players do not experience negative emotions such as frustration; instead, we suggest that such emotions were less likely to consistently lead to episodes of choke amongst trained or expert groups. As emotion regulation has been cited as a skill critical to success in competitive video game play (Nagorsky & Wiemeyer, 2020), professional players may have developed strategies to cope with negative emotional states. Supporting this, Poulus et al. (2021) likewise found that elite players use mental strategies to regulate their emotions and avoid feelings of tilt.

Poulus et al. (2021) suggest that elite esports players experience high levels of confidence, uninterrupted focus, and flow states when playing well. Consistent with these findings, we speculate that professional players are unlikely to experience feelings of *Underconfidence*, *Frustration*, or *Lack of Focus* prior to a choke event as they are not conducive to maintaining optimal performance. Rather, professional players may mentally block out these feelings to avoid interrupting flow states and diminishing confidence in their performance. In line with this sentiment, coping literature suggests players tend to adopt more avoidance strategies—such as avoiding certain situations or shifting focus towards different goals—during competitive play (Kou & Gui, 2020; Leis et al., 2022; Smith et al., 2019). Applying such strategies during the game may help players direct attention towards the next goal rather than ruminate on past performance failures. As the stakes for professional players are much higher, they are likely more motivated to maintain focus and regain control of their performance.

Pressures

Both professional and amateur players shared *Stakes Pressure* and *Spectator Pressure*, although the context of these pressures differed. For amateurs, *Stakes Pressure* was cited less often and manifested as a desire to advance in rank or win a prize in local tournaments. In contrast, *Stakes Pressure* was perceived as more significant among professional players. Professionals compete in more prestigious tournaments or leagues with tournament placement, prize money, and their careers potentially on the line. For *Spectator Pressure*, the context of these experiences also differed where amateurs referred to in-game viewers or friends as 'spectators', while professionals extended 'spectators' to include a broader audience (e.g., live audiences, Twitch viewers, and other professionals). Furthermore, professionals are likely to perform for much larger audiences compared to amateurs, possibly elevating the pressure experienced. Research suggests that this increase in self-awareness may induce declarative processing, resulting in performance decrements (Fenigstein et al., 1975; Williams et al., 2005). In recent work investigating choke and clutch, public self-consciousness (i.e., awareness of oneself in public settings) was positively correlated with choking propensity, while social anxiety (i.e., awareness of oneself within social groups) was negatively associated with propensity to clutch (Beres et al., 2021). As such, professionals may be more susceptible to experiencing episodes of choke due to the increased intensity of the spectator and stakes pressures they endure.

Likewise, parallels are drawn between amateur players' *Social Pressure* and professional players' *Team Pressure*. While the context of these pressures differ, the underlying motives for both amateur and professional players are similar, i.e., to avoid letting others down. Professional players cited pressures specific to their team, such as not wanting to let their teammates down or

possibly hinder employment status and opportunities. In contrast, amateur players reported a broader social pressure to perform well to avoid blame for negative outcomes or to prove their worth among friends. In line with broader social pressures, we identified *Sexism* in relation to performance failures in professional play with the woman professional player reporting stereotype threat as a contributing factor underlying her choke event. Research by Madden et al. (2021) found that gender stereotypes persist within esports, wherein men are perceived as more 'competitive' while women are perceived as more 'emotional'. These gender stereotypes contribute to a phenomenon known as stereotype threat in which perceived performance decrements occur due to knowledge of a negative stereotype of one's social group, regardless of actual skill (Beilock & McConnell, 2004; Steele & Aronson, 1995). This has been shown to negatively affect women's online performance in digital gaming contexts (see Kaye & Pennington, 2016; Pennington et al., 2018; Vermeulen et al., 2016). Interestingly, amateur players did not report sexism in relation to their choke events despite a considerable sample of women (n=47). This may be due to the lack of gender visibility in online gaming spaces—women are able to mask their identity online by using ambiguous gamer tags or by opting out of in-game voice communication to avoid harassment (Fox & Tang, 2017). However, women in the professional scene are more visible (e.g., LAN events, streaming platforms, live audiences, team-related marketing, etc.), resulting in more opportunity for gendered discrimination or stereotype threat related performance decrements.

Professional players reported several unique pressures associated with choke, including *Stage Pressure*, *Team Pressure*, *Reputation Pressure*, and *Rival Pressure*. Unlike amateur players who report engaging in more casual competition (e.g., climbing the ranked ladder) in the comfort of their own home, professional players must endure the pressures induced by being on stage (*Stage Pressure*) which involve competing in unfamiliar environments and adapting to uncomfortable setups. While amateur players cite *Distractions and Distractors* as pressures leading to choke such as being disconnected from the game or being distracted by friends and family, these factors are not comparable to competing in a foreign environment wherein external variables are much more unpredictable. Furthermore, professional players experience an array of pressures associated with being on an organized team (*Team Pressure*) such as not wanting to let their teammates down or sabotage their team's success (e.g., tournament placement, employment). Research suggests that team cohesion is an integral component of success in competitive play (Freeman & Wohn, 2017)—this may be of particular importance for professional players who must communicate and coordinate with the same roster of players. In professional play, players also reported experiencing *Reputation Pressure*—i.e., a desire to uphold one's performance reputation. In high-level play, professional players develop reputations (e.g., clutcher) they feel they may have to maintain to avoid letting their team or fans down. Likewise, this pressure may also manifest in reverse via *Rival Pressure* (i.e., pressure associated with facing a high-performing rival team or player). Knowingly entering a match against a rival team or player may lead to fear or doubts in one's abilities prior to competition. As such, mental states may already be compromised before the match has begun, leading to potential episodes of choke.

Choke Episode

In this section, we turn to the episode of choke. To explore RQ2 (*"How do performance failures manifest during a choke event?")* and RQ2a (*"Are there any differences in how esports professionals experience choke compared to amateurs?"),* we discuss the themes identified under *Performance Failures*.

Performance

All players shared *Non-Specific Choke*, *Mechanical Choke*, and *Strategic Choke*; however, the significance of performance failures differed among amateur and professional players. Amateur players reported more instances of *Mechanical Choke*, whereas professional players experienced more instances of *Strategic Choke*. In line with work investigating procedural and declarative processing in relation to choke—i.e., reverting to declarative processing disrupts performance of a formerly automated task—amateur players may suddenly rely on explicit rules during high pressure scenarios resulting in mechanical errors (e.g., missing shots) (Baumeister, 1984; Masters et al., 1993). Furthermore, amateur players tend to rely on such explicit rules when developing new mechanical skills (e.g., spray patterns, crosshair placement, etc.); however, these skills become proceduralised with experience (Williams et al., 2005). For professionals, mechanical errors are less frequent as the motoric components of mechanical play become automated through muscle memory. In contrast, professional players are more likely to suffer from strategic choke in which coordinated team-based decision making is less likely to rely on procedural knowledge; rather, it is a complex combination of game knowledge and situational variables. Furthermore, professional players may be more likely to identify when they make a strategic error compared to amateurs due to their increased experience and knowledge of the game—and may also place greater importance on both the development and execution of a strategy.

Practical Implications and Future Research

Our research highlights several implications that are useful for better understanding how choke manifests in esports contexts across amateur and professional populations of players. First and foremost, we found that the subjective experiences of choke differ among amateur and professional players, with several unique pressures and mental states emerging for each group. These findings emphasize the importance of investigating specific populations of players rather than generalising one groups' experiences to that of others. Identifying how specific populations experience choke provides researchers and organisations the knowledge required to better support players in maintaining optimal performance. For instance, training interventions may be tailored towards targeting unique pressures experienced by specific groups of players. Professionals may benefit from team-building strategies designed to enhance team cohesion and communication in an effort to alleviate *Team Pressure*. Additionally, desensitisation strategies may be employed to help familiarise players with uncomfortable experiences (e.g., *Spectator Pressure*, *Stage Pressure*) by exposing players to live performances in unfamiliar environments. Comparatively, game design and development may benefit from the consideration of pressures experienced by amateur players. This is more pronounced in novice amateur players, wherein ongoing play is contingent on continued motivation to engage. For example, *Spectator Pressure* may be relieved somewhat by offering players the functionality to opt out of user interface elements that indicate the number of current spectators; alternatively, the obfuscation of individual performance statistics (as in *Overwatch 1*) may lessen anxieties stemming from *Social Pressure*.

While this study provides a better understanding of how choke *manifests*, additional research is required to gain insight into how players cope with such events. Future research should continue to investigate how professional players cope with experiences of choke as professional players are necessarily more motivated to maintain performance, they may have developed effective coping mechanisms that amateur players may benefit from adopting (see Hong & Connelly, 2022).

Furthermore, research should investigate choking from the perspectives of coaches and managers, and how organisational staff supports their players. Organisational staff may be able to provide more objective observations of players' experiences of choke and, in turn, aid in the development of effective coping strategies tailored towards the needs of each player. Researchers and various esports personnel would also benefit from gaining a better understanding of how gender influences choke (i.e., stereotype threat). Women are an underrepresented population in esports; as such, investigating women's experiences of choke, particularly the effects of stereotype threat on performance, may better help organisational staff support the professional development of women. Lastly, further exploration of how optimal performance manifests (i.e., clutch) may contribute to a better understanding of performance maintenance and the prevention of choke.

Limitations

In this research, we qualitatively investigated the experiences of both amateur and professional populations of esports players; however, we do not provide an account of choke across *all* levels of experience and ability. When conducting future studies on specific populations of players, researchers should be mindful of how they define such populations to ensure the subjective experiences of one group do not become generalised across varying levels of expertise. We also acknowledge that while we were deliberate with our defining characteristics for each group, our populations do not encompass all demographics of gamers and our samples lack equal representation from women and different regions. Additionally, our study focused exclusively on experiences of choke within MOBA and FPS genres. Future research should continue to investigate how choke manifests across different gaming contexts (e.g., real-time strategy, racing games, fighting games, etc.). Finally, we did not assess both populations using the same methods. Owing to their comparative rarity, we employed interviews for professional players to better obtain the rich data required for a complete understanding of a choke event; in comparison, as amateur players are more diverse in their experiences (as they are not confined to a professional format), we employed the survey method to encapsulate this broader variety in perspective through a larger sample size. Future research would benefit from applying alternate research methods (such as longitudinal analyses or diary studies), which may provide a more holistic understanding of how choke is experienced and managed across time.

Conclusion

In this paper, we investigated the experiences of choking (critical underperformance in high-pressure scenarios) amongst amateur and professional esports players. In the development of both facilitative and representational themes, we found that choke manifests in unique and shared ways for both amateur and professional esports players. In particular, the specific context of professional esports represents the addition of pressures distinct to this environment—e.g., *Stage Pressure*, *Reputation Pressure*, *Rival Pressure*, and *Sexism*. However, amateur players are also not immune to their own unique or more dominant antecedents, such as mental states including *Underconfidence* and *Lack of Focus*. We also find commonalities across both groups, such as *Overconfidence*, and fear of social judgment (encapsulated in both '*Social Pressure*' and '*Team Pressure*' themes). Finally, we find that the choke episode itself manifests differently for both groups: while amateur players struggle with *Mechanical Choke* (that is, a failure of input or response time), professional players describe more concerns with *Strategic Choke* (a failure in the execution of strategy, or being strategically outmaneuvered). By unpacking the experience of choke amongst both amateur and professional esports players, our work represents a step towards better understanding and supporting performance in all contexts of esports play.

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