"An Odd Kind of Pleasure": Differentiating Emotional Challenge in Digital Games

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ABSTRACT
Recent work introduced the notion of *emotional challenge* as a means to afford more unique and diverse gaming experiences. However, players' experience of emotional challenge has received little empirical attention. It remains unclear whether players enjoy it and what exactly constitutes the challenge thereof. We surveyed 171 players about a challenging or an emotionally challenging experience, and analyzed their responses with regards to what made the experience challenging, their emotional response, and the relation to core player experience constructs. We found that emotional challenge manifested itself in different ways, by confronting players with difficult themes or decisions, as well as having them deal with intense emotions. In contrast to more 'conventional' challenge, emotional challenge evoked a wider range of negative emotions and was appreciated significantly more by players. Our findings showcase the appeal of uncomfortable gaming experiences, and extend current conceptualizations of challenge in games.

Author Keywords
Emotional Challenge; Challenge; Emotion; Player Experience.

ACM Classification Keywords
K.8.0 Personal Computing: Games

INTRODUCTION
Challenge is commonly at the core of the player experience [10, 11, 42] and one of the chief reasons why people enjoy playing digital games [26, 28]. Recent work introduced the notion of *emotional challenge* [3, 9, 11], a distinct type of challenge "which confronts players with emotionally salient material or the use of strong characters, and a captivating story" ([11], p. 2513), and wherein the core pleasure lies in resolving tension built up by the narrative and the emotional exploration of ambiguity [3, 9]. Indeed, a recent study showed that emotional challenge plays a crucial role for the entertainment experience of film viewers [3]. Similarly, the notion of emotional challenge holds great promise for a better understanding of the player experience (PX). First, several scholars have emphasized the importance of exploring and understanding diverse types of game experiences [43], specifically with regards to the emotional spectrum games may evoke [16, 29, 35]. Indeed, emotional challenge was suggested to afford a wider range of emotions, beyond the frustration-fiero cycle [26] typical of more 'conventional' challenge [9]. Second, it may contribute to a more nuanced understanding of challenge in games, which was argued to be insufficient in current player experience research [11]. Third, as emotional challenge typically involves players confronting difficult subject matters [9], it may inspire the design of games aimed at raising awareness about real-world issues [15, 29]. Similarly, previous research has discussed the potential of games for emotional learning [27, 40]. A clearer understanding of what constitutes emotional challenge may hence inform the design and evaluation of such games. Finally, studying emotional challenge in games may provide novel insights into the nature of uncomfortable yet worthwhile interactions [5, 8].

Yet despite this promise, emotional challenge in games has received scant attention so far [11] and, to our knowledge, the concept has never been empirically explored. As a result, we know relatively little about what constitutes emotional challenge in games, how it shapes the player experience and which emotional responses it may evoke, as well as what differentiates it from more conventional notions of challenge in games. To address these research gaps, we analyzed 171 players' accounts of either a challenging or an emotionally challenging game experience. The contribution of our study is threefold: First, we provide empirical evidence of how emotional challenge affects the player experience. Specifically, we found that while emotional challenge evoked a more diverse range of negative emotions compared to more conventional challenge, players appreciated these experiences significantly more. Second, we identify different ways of how emotional challenge may manifest in games – confronting players with difficult themes, letting them enact situations and decisions with no discernible positive outcome, as well as having them deal with intense negative emotions. Third, our findings showcase the ways in which emotional challenge runs counter to notions of conventional challenge,

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such as performance and winning, extending current conceptualizations of challenge in games.

RELATED WORK

Challenge is typically considered to be at the heart of the player experience [10, 11, 42], and one of the main reasons why players enjoy games [26, 28]. Broadly speaking, challenge in games is understood as any task that is nontrivial for the player to accomplish [2, 38]. Through repeated attempts and failures to overcome a challenge, players eventually improve in skill [22]. While some players enjoy excessive challenge [34], generally, an appropriate challenge-skill balance – where the player's skill evenly matches the challenge of the game – is considered optimal [19], most enjoyable [24] and most immersive [10, 12, 18].

Generally, digital games are considered to present two types of challenge, *physical challenge* and *cognitive challenge* [2, 10, 11, 38]. Physical challenge tests the player's physical skill, requiring high speed and accuracy, strength, physical endurance, and dexterity [10, 38]. Cognitive challenge, in contrast, puts demands on the player's mental abilities [10], and often requires memory and observation skills [38]. In an experimental study, Cox et al. [10] found that adding cognitive challenge to physical challenge enhanced players' immersion, indicating that different challenge types may lead to different player experiences [11]. More recently, Denisova et al. [11] considered *social challenge* – which puts players' social skills to test to read opponents' movement or coordinate with team mates [38] – a subset of cognitive challenge, as it requires players to deal with hidden information [28].

Emotional Challenge

Recent work introduced the notion of *emotional challenge* [9, 11] as a complement to more 'conventional' types of challenge. (Note that by 'conventional challenge', we do not mean to imply that it is uninteresting or undesirable, but rather that it has received relatively more attention in the game design and research literature). In the context of games, the term 'emotional challenge' was first coined by Cole et al. [9] in their analysis of professional critics' game reviews. *Emotional challenge* confronts players with difficult themes or the use of strong characters and good writing, and requires players to comprehend ambiguous emotional and narrative experiences. Moreover, Cole et al. argue that players cannot overcome emotional challenge with skill or dexterity, but rather by dealing with the difficult material and by understanding the ambiguous elements of the diegesis. Specifically, they found that core games (i.e., AAA games, such as Gears of War 3, Grand Theft Auto V) were typically reviewed with regards to the functional challenge they provided, an umbrella term subsuming physical and cognitive challenge. In contrast, avant-garde games (often indie productions, e.g., To the Moon, Papers Please) were more likely to confront players with emotional challenge. Moreover, Cole et al. found that for core games, critics mostly valued gameplay and replayability, whereas the value of avant-garde games lies in the novelty, intensity, and quality of the evoked emotional experience, as these games typically make use of simple controls and gameplay mechanics (i.e., low functional challenge). Accordingly, functional and emotional challenge are considered to be largely antagonistic [9].

According to Cole et al. [9], emotional and functional challenge afford very different player experiences. The core pleasure of functional challenge lies in how powerful the game lets the player feel. Consequently, it evokes few emotions other than the feelings of frustration and pride characteristic of hard fun [26]. In contrast, the pleasure of emotional challenge is derived from resolving tension built up by the narrative, identification with characters, and the emotional exploration of ambiguity and solitude. Hence, emotional challenge is said to give rise to a more reflective state of mind and evoke a wider range of emotions, beyond feelings of frustration and pride – although Cole et al. [9] do not provide further details. Indeed, emotional challenge in games has to our knowledge not yet been empirically investigated, and little is known about how 'everyday' players (rather than professional game critics) experience it. Moreover, the characteristics of emotional challenge described by Cole et al. [9] mainly address the narrative aspects of games.

Similar concepts to emotional challenge have been discussed with regards to film viewers' entertainment experience. Affective challenge requires viewers to deal with and regulate intense negative emotions [3, 14], such as fear and disgust in horror movies. In contrast, cognitive challenge (not to be confused with cognitive challenge in games [10, 11]) requires viewers to keep track of a complex narrative (e.g., interrelated stories or multiple plot lines), or interpret the meaning behind it [3, 14], incidentally bearing more semblance to emotional challenge as defined by Cole et al. [9]. In a subsequent study, Bartsch and Hartmann [3] explored how these two challenge types relate to film viewers' entertainment experience. Films such as light-hearted comedies presented neither type of challenge, and were experienced as most fun, but little more. Affective challenge was associated with particularly suspenseful movie fare, such as horror and action movies. In contrast, cognitive challenge was characteristic of more intellectual movies, such as documentaries, and was associated with appreciation. Lastly, some films, such as dramas and thrillers, provided viewers with both affective and cognitive challenge – and while perceived as less fun, scored highest on suspense and appreciation.

Emotional challenge in games has so far received little attention [11], although relevant related work has emerged in recent years. Bopp et al. [6], for instance, found that most players valued emotionally moving game experiences, precisely because it made them feel sad and contemplative. Wilson and Sicart [43] discussed several examples of abusive game design, such as evoking frustration with extreme difficulty or embarrassing players with games requiring unusually high degrees of physical intimacy. In another example, Lobel et al. [27] designed a horror game for players to train emotion regulation skills in face of stressful situations. Marshall et al. [30] suggest designing for and around fatigue and (emotional) pain to make for more intense and engaging exertion game experiences. Other studies confronted players with difficult themes, such as rape [32], human error and blame cultu-

re in the healthcare domain [15], or requiring players to lie in a coffin wearing a VR headset [8]. Beyond games, Benford et al. [5] outlined different ways to design for uncomfortable interactions, which still provide people with worthwhile experiences, such as having them engage with dark and challenging themes, or by letting people directly make difficult decisions. Relatedly, Jørgensen [21] interviewed players about instances of positive discomfort with the game *Spec Ops: The Line*, and found that the sense of complicity it triggered in players afforded deep emotional experiences. However, none of the aforementioned work has explicitly addressed emotional challenge in games.

METHOD

We conducted an online survey composed of both open-ended questions and psychometric PX measures. As we were interested in exploring how players understand emotional challenge in games, as well as how this may differ from more 'conventional' notions of challenge, we asked participants to either recount an *emotionally challenging* or a *challenging* game experience.

Participants

Participants were recruited from various social networks (e.g., Facebook, Twitter), and gaming-related groups on Facebook and Reddit. A total of 188 participants completed the survey, but 17 participants were excluded because participants reported (i) never having been challenged (n=4) or emotionally challenged (n=3) by a game, (ii) described experiences about more than one game (n=7), or (iii) provided bogus answers (n=3). This resulted in a final sample of 171 participants (29.8% women), ranging from 18 to 56 (M=26.0) years of age. On average, participants had been playing digital games for 16.7 years (ranging from less than a year to 41 years). The four most popular game genres were role-playing (n=141), adventure (n=138), action (n=124), and strategy games (n=122). In return for their participation, participants could enter a raffle to win one of 10 $20 (USD) Amazon gift cards.

Procedure

Upon clicking the survey link, participants were introduced to the study and asked for consent. Next, they were randomly distributed to one of the two conditions: A guided recall approach similar to the study of Johnson et al. [20] was used, asking participants to bring to mind and write about a game experience that was either *emotionally challenging* or *challenging*, respectively. As we were interested in what players themselves perceive as (emotionally) challenging, no definition or examples were provided. Participants were also asked to elaborate what exactly in their opinion made the experience (emotionally) challenging, as well as describe their emotional response during the experience. They were also asked to indicate which game their experience involved, as well as how long ago their experience had taken place. Afterwards, participants rated their experience in terms of immersion, enjoyment, suspense, appreciation, and competence. Finally, they provided demographic information (age, gender, game experience, and preferred game genre). At the end of the survey participants could enter their email address, if they wished to enter the raffle. The survey took 22.0 minutes to complete on average.

Player Experience Measures

All measures consisted of 7-point Likert scales ranging from strongly disagree (1) to strongly agree (7), unless noted otherwise. Reliability scores (Cronbach's α) and descriptive statistics are listed in Table 1.

Immersion

Immersion is commonly understood as "the sense of being absorbed in a game to the exclusion of all else outside of the game" (p. 80, [10]) and is often considered key to good player experience [7, 12, 18]. We chose to assess immersion, as different forms of challenge (i.e., cognitive and physical) have been found to influence immersion in different ways [10]. Specifically, we employed the 31-item Immersive Experience Questionnaire (IEQ, 7-point Likert scale, ranging from 1 = not at all to 7 = a lot) developed and validated by Jennett et al. [18]. The IEQ consists of five subscales measuring different components of immersion: (1) The perceived degree of *Challenge*. (2) The extent players felt in *Control* while playing. (3) *Cognitive Involvement* refers to the cognitive effort and attention required while playing, which has been linked to both emotional and functional challenge in games [9]. (4) *Emotional involvement* addresses players' emotional response and attachment to the game, and (5) *Real world dissociation* pertains to the extent of losing awareness of one's surroundings.

The items "*How much did you want to "win" the game?*" and "*When interrupted, were you disappointed that the game was over?*" were excluded from data analysis, because several participants had commented in the survey that they had not been interrupted during the experience, or that their experience was not about winning or losing. The item "*Did you feel the urge at any point to stop playing and see what was happening around you?*" was also excluded, because several participants noted difficulties when answering this question.

Enjoyment, Suspense and Appreciation

Enjoyment is considered another key PX dimension [31], and players often enjoy being challenged in games [24, 34]. Similarly, *Suspense* was found to be one reason why players enjoy challenge in games [1], as well as related to emotionally challenging movie experiences [3]. *Appreciation*, in turn, refers to an experiential state characterized by feeling moved and perceiving media as meaningful and thought-provoking [33]. It has previously been linked to both affective and cognitive challenge in movies [3], as well as emotionally moving game experiences [6]. Hence, we assumed appreciation to be also relevant for emotionally challenging game experiences. All three constructs – enjoyment, suspense, and appreciation, – were measured with the scale developed by Oliver and Bartsch [33] with three items each.

Competence

In PX research, challenge and competence are often considered to be related, albeit distinct constructs [11, 24, 34]. Therefore, we assessed competence with the three-item Player

Variable	Cronbach's α	Source	M Challenging (SD)	M Emotional (SD)	M Overall (SD)	t-value	U-value
Appreciation	.87	[33]	3.96 (1.82)	5.11 (1.59)	4.53 (1.80)	4.28**	2.30**
Enjoyment	.95	[33]	5.14 (1.92)	4.75 (1.99)	4.91 (1.97)	-1.33	4.08
Suspense	.84	[33]	4.91 (1.92)	5.02 (1.63)	4.94 (1.78)	.15	3.76
Immersion							
Challenge	.65	[18]	22.10 (3.68)	17.83 (5.74)	19.92 (5.28)	-5.81**	5.34**
Cognitive involvement	.83	[18]	46.02 (6.39)	41.84 (8.90)	43.89 (8.03)	-3.54**	4.73**
Control	.63	[18]	18.71 (5.50)	18.74 (5.23)	18.73 (5.35)	.03	3.67
Emotional involvement	.69	[18]	24.63 (6.19)	25.14 (6.65)	24.89 (6.41)	.52	3.37
Real World dissociation	.81	[18]	30.05 (8.74)	27.89 (7.39)	28.95 (8.13)	-1.75	4.22
Total	.85	[18]	141.51 (20.31)	131.43 (22.69)	136.38 (22.08)	-3.06*	4.56**
Competence							
PENS Competence	.87	[37]	4.67 (1.57)	4.81 (1.63)	4.73 (1.61)	.40	3.49
Wirth Competence	.75	[44]	4.22 (1.52)	4.30 (1.81)	4.25 (1.68)	.36	3.50

Table 1. Reliability scores and descriptive statistics for both conditions (emotional, n=87; challenging, n=84). Note that the means of all immersion scales were formed by adding up each player's scores. * Significant at p ≤ .01. ** Significant at p ≤ .001.

Experience Need Satisfaction (PENS) competence scale [37]. As we were particularly interested in emotional challenge, we additionally included the competence scale developed by Wirth et al. [44] (hereafter referred to as Wirth Competence to avoid confusion with the PENS competence scale). This scale consists of three items (e.g., "I had a good feeling because the emotions that I felt during this experience challenged me in a positive way") and has previously been employed to assess people's feelings of competence when confronting difficult and emotionally challenging themes in movies [44].

Development of the Coding System

As our aim was to identify characteristics of different types of challenge, – in particular, what players thought made their experience (emotionally) challenging, – we employed qualitative content analysis [17] to analyze participants' experience accounts. An initial coding system was prepared based on Adams' [2] traditional challenge categories, further complemented with characteristics Cole et al. [9] deemed typical of emotional challenge (e.g., ambiguity, difficult themes, identification). Based on the initial coding of a random subset of 80 experience descriptions, the first author expanded the coding system with additional codes that emerged from players' experience descriptions (e.g., maintaining focus, deal with emotions). The final coding system consisted of 16 main categories, which were further divided into 20 subcategories. Additionally, participants' emotional responses were coded based on Scherer's [39] emotion categories, which consist of 38 main emotion stems, each described by several similar emotions (e.g., the *anger* stem includes *angry, enraged, furious, irate* etc.). After the initial coding phase, it was decided to code *frustration* as an individual stem, and feelings of *loneliness and being lost* were added as another stem. Descriptions, examples, and frequencies of all codes are listed in the supplementary material available at https://doi.org/10.1145/3173574.3173615.

The first author coded all open-ended answers. Sentences formed the smallest coding units and could be coded into several categories. To ensure interrater reliability, an independent coder coded a random subset of 80 experience reports. As only two coders were involved in the coding process, Cohen's κ was calculated [41]. Interrater agreement was substantial (mean Cohen's κ=.76; range κ=.63 to κ=1.00), in line with Landis and Koch's recommendations [25].

RESULTS

Of the 171 participants, 84 recounted a challenging experience, and 87 an emotionally challenging experience. The most frequently mentioned games were World of Warcraft (n=8), Dark Souls (n=6) and League of Legends (n=5). Among challenging experiences, World of Warcraft (n=5) and Dark Souls (n=4) were most frequent, whereas Grand Theft Auto V (n=3) and League of Legends (n=3) were most common in the emotionally challenging condition. Time since participants' experience had taken place was comparable between conditions, ranging from less than one month ago (n=37), to more than ten years ago (n=12). Most participants recounted an experience that occurred more than 2 years ago (n=49).

To explore what player experience dimensions characterized the two challenge conditions, we conducted a set of independent samples t-tests[1] (see Table 1 for descriptive statistics and t-values for all variables). Additionally, Pearson's correlations of all variables showed that most variables correlated significantly with each other (range r=.15 to r=.67). The correlation matrices over the entire sample and per condition are provided in the supplementary material. In the following we report the results of the independent samples t-tests.

First, while emotionally challenging experiences were rated as moderately challenging (M=17.83 from a possible maximum score of 28), the challenging condition was rated as significantly more challenging (t(169)=-5.77; p<.001). Similarly, although both conditions scored rather high on total

[1]Except for IEQ real world dissociation, variables were not normally distributed (calculated via Kolmogorov-Smirnov test of normality). While multivariate tests are considered fairly robust against the violation of normality assumption [13], we additionally conducted Mann-Whitney U tests, which yielded comparably significant differences between conditions as the t-tests (see Table 1).

immersion and cognitive involvement (maximum scores 196 and 56, respectively), challenging experiences were perceived as significantly more immersive (t(169)=-3.06; p=.003) and cognitively involving (t(169)=-3.54; p<.001). Notably, several participants in the emotionally challenging condition commented specifically on the IEQ item [How well do you think you performed in the game?]: '*When I say that I e.g performed well I mean that only in the sense that I performed well in thinking about the game and taking a valuable lesson from it*' (P21, The Beginner's Guide, ECC[2]), or '*I mean, how well can you perform a torture? If you get the information, I guess you did well, but it's still wrong...'win' – I just wanted it to be over*' (P76, Grand Theft Auto V, ECC). No significant differences were found with regards to participants' emotional involvement, sense of control or real world dissociation, which were moderately high for both conditions.

Emotionally challenging experiences were appreciated significantly more (t(169)=4.28; p<.001) than challenging experiences. In other words, participants generally found emotional challenge in games quite meaningful. In contrast, while not significantly different, players rated the challenging experiences as more enjoyable. Notably, both experiences were characterized by rather pronounced feelings of suspense, indicating that suspense is relevant for both challenging and emotionally challenging experiences. Lastly, no significant differences were found for either of the competence measures. Overall, participants reported feeling rather competent during their experience.

Participants described a wide variety of emotional responses. As listed in Table 2, participants described more negative (n=274) than positive emotions (n=112) overall. In the challenging condition positive emotions were mentioned more than twice as much compared to the emotionally challenging condition (Mann-Whitney U=4.79, p<.001), with participants significantly more often describing feeling joyful (Pearson's χ^2=7.04, p<.001) and happy (χ^2=6.61, p<.001) after overcoming a challenge. While no significant differences emerged between conditions with regards to the frequency of negative emotions (U=3.24, p=.186), challenging experiences mainly evoked frustration (χ^2=21.19, p<.001), while emotionally challenging experiences evoked a wider range of negative emotions with anger, and sadness being the most prominent ones. For a list of all emotions refer to the supplementary material available at https://doi.org/10.1145/3173574.3173615.

Emotions	Challenging n = 84 (%)	Emotional n = 87 (%)	Overall n = 171 (%)	χ^2
Positive	78	34	112	
Joy	19 (22.6)	7 (8.0)	26 (15.2)	7.04**
Happiness	14 (16.7)	4 (4.6)	18 (10.5)	6.61**
Contentment	10 (11.9)	1 (1.1)	11 (6.4)	8.21**
Relief	9 (10.7)	2 (2.3)	11 (6.4)	5.03*
Pride	8 (9.5)	2 (2.3)	10 (5.8)	4.05*
Negative	125	149	274	
Frustration	46 (54.8)	18 (20.7)	64 (37.4)	21.19***
Anger	25 (29.8)	28 (32.2)	53 (31.0)	.12
Sadness	7 (8.3)	24 (27.6)	31 (18.1)	10.67***
Fear	5 (6.0)	14 (16.1)	19 (11.1)	4.45*
Tension/stress	8 (9.5)	11 (12.6)	19 (11.1)	.42

Table 2. Frequencies of top five most commonly mentioned positive and negative emotions per condition. Note that numbers do not add up to 100%, because participants often reported several emotions.* Significant at p≤.05. Significant at p≤.01. *** Significant at p≤.001.**

Challenge Types

Overall, *cognitive challenge* was the most frequently described challenge type (n=40, see also Table 3), followed by *actions and decisions* (n=37). The category *other* included more generic descriptions of a game's difficulty, for instance, '*It was so difficult that it made me so mad*' (P143, Super Mario Bros., ECC), or referred to technical bugs and usability issues: '*The game was so poorly designed. It was obnoxious*' (P22, The Sims 3, ECC). Note that 36 participants reported more than one challenge type, indicating that challenge types are not forcibly mutually exclusive.

[2]Emotionally Challenging Condition

Pearson's χ^2-tests (see Table 3) revealed that cognitive and physical challenge were significantly more frequent in the challenging condition (χ^2=43.97, p<.001 and χ^2=15.22, p<.001, respectively). In contrast, decisions and actions (χ^2=36.11, p<.001), and difficult themes (χ^2=20.08, p<.001) were significantly more frequent in the emotionally challenging condition, suggesting that participants largely interpreted emotional challenge different from challenge. However, no significant differences were found for social challenge and dealing with intense negative emotions.

In the following, we first report the challenge types most prominent in the challenging condition, followed by those most characteristic for the emotionally challenging condition. Finally, we describe the challenge types that occurred to similar degrees in both conditions. Full text examples of the individual challenge types, as well as the corresponding descriptive statistics for all player experience measures are provided in the supplementary material.

Challenge Types	Challenging n = 84 (%)	Emotional n = 87 (%)	Overall n = 171 (%)	χ^2
Cognitive Challenge	38 (45.2)	2 (2.3)	40 (23.4)	43.97*
Physical Coordination	20 (23.8)	3 (3.4)	23 (13.5)	15.22 *
Decision & Actions	2 (2.4)	35 (40.2)	37 (21.6)	36.11*
Difficult Themes	1 (1.2)	21 (24.1)	22 (12.9)	20.08*
Intense Emotion	10 (11.9)	11 (12.6)	21 (12.3)	.34
Social Challenge	14 (16.7)	8 (9.2)	22 (12.9)	2.13
Other	10 (11.9)	10 (11.5)	20 (11.7)	.01

Table 3. Challenge type frequencies per condition and χ^2-values. Note that numbers do not add up to 100%, because an experience report could describe several challenge types. * Significant at p≤.001.

Cognitive Challenge

Adams [2] originally distinguished several types of challenge that typically require considerable mental effort, strate-

gic planning or lateral thinking (e.g., logic and mathematical challenges, pattern recognition challenges, exploration challenges, conflict, economic challenges, etc.). As these challenge types all involve players cognitively, we decided to group them under the moniker *cognitive challenge*.

Cognitive challenges were most frequently reported in the challenging condition (n=38), with many participants describing experiences where they had to figure out enemy patterns, e.g., '*learning how each enemy moves is a good challenge*' (P156, Rogue Legacy, CC[3]), or plan ahead to overcome obstacles: '*The game forces the player to really carefully plan every step you'll take*' (P164, Forbidden Siren, CC). When confronted with cognitive challenges, '*focus was essential, if I got distracted, I lost*' (P10, Dark Souls 3, CC). Accordingly, this challenge type scored highest on cognitive involvement (M=48.0) and also total immersion (M=146.8). Confronting these cognitive challenges often made players feel angry, frustrated and as '*the tension rises, my mind is racing trying to keep up*' (P29, Dark Souls, CC), while successfully overcoming cognitive challenges evoked '*a sense of accomplishment*' (P63, Destiny, CC) or '*relief and pride*' (P91, Dark Souls, CC). Among all challenge types, cognitive challenge scored highest on enjoyment (M=5.83) and players reported being '*really happy that the game was requiring me to think and properly plan ahead*' (P145, Europa Universalis 4, CC).

Physical Coordination

Physical coordination challenges put great demands on players' dexterity and reflexes. Participants described struggling with precise timing and perfect execution of in-game actions: '*The race forgave you absolutely no errors, you had to drive 2 laps without ever making a single mistake*' (P60, Mafia I, CC), or '*I just kept getting the timing wrong and had real difficulty shooting a new portal in the ground straight*' (P46, Portal, CC). Others blamed themselves when failing and stated '*that my slow reaction time is the most challenging part*' (P92, Super Smash Bros., CC).

Besides twitch skills, physical coordination challenges also required practice and cognitive effort, as '*the challenge here was to learn the attack techniques, that means the button combination for the different attacks*' (P44, Tekken, CC). Participants reported that replaying the same challenging sequence over and over again was essential to their memorizing the action sequences. '*It took me dozens of tries of memorizing the patterns and timing my dodges and attacks to defeat her*' (P35, Shovel Knight:Specter of Torment, CC).

Participants described similar emotional responses to those recounted for cognitive challenge. Frustration and anger were prominent when tackling the challenge: '*the amount of times I died on that stage made me rage at a game for the first time*' (P32, Harry Potter and the Philosopher's Stone, CC). Yet overcoming it gave rise to feelings of joy, pride and relief, so that '*right after killing the boss I felt super relieved and happy*' (P21, World of Warcraft, CC).

[3]Challenging Condition

Decisions and Player Actions

In-game decisions were often experienced as emotionally challenging (n=35) when the consequences of players' choices were ambiguous, so that '*neither option is clear cut to be right*' (P55, Life is Strange, ECC). Such decisions had participants '*question(ing) if I made the right decision, or if there even was a right decision*' (P149, Grand Theft Auto V, ECC). Others explained that being aware of the outcomes of their decision was emotionally challenging, especially when all outcomes were perceived as undesirable: '*a set of choices where neither of them are ones you would choose*' (P44, The Witcher 3, ECC). Many participants pondered what option to choose, sometimes even pausing the game because they '*had to leave the PC and needed like 10 minutes to evaluate my options and then come back to choose the less worse answer I had to face*' (P52, The Walking Dead, ECC). The same participant further commented that '*it's actually more stressful without a time limit, when the only given options you got are both nothing you like to pick*'.

Some participants explained that the decision was emotionally challenging, because they were torn between gameplay advantages and their attachment to certain characters: '*I had invested more into Kaiden with the plan of upgrading Ashley later. I actually preferred Ashley but I had to choose between the two and saving Kaiden made more sense*' (P125, Mass Effect 1, ECC). Similarly, some felt conflicted when gameplay goals clashed with their personal values and convictions: '*I found a relatively effective method of gaining money, which was to reject suspicious documents immediately, ignore pleas for mercy and appeals for assistance. Dealing with those narratives meant that I was wasting time* [...] *At one point during my play, the game became very challenging because I questioned my actions; Can I live with myself by following this 'effective' but rather ruthless method?* [...] *I then realized I was in an almost unconscious part of a heartless system which left me with a real feeling of guilt and blame, this is what made the rest of the game challenging for me as I struggled to balance my family's well being as well as caring for other people*' (P112, Papers, Please, CC). Participants experiencing such conflict felt '*frustrated by my inability to make the unethical choice despite anticipating what it would lead to*' (P56, BioShock Infinite, ECC) or '*even in a video game, I was too disgusted by the idea of enslaving thousands of free beings.* [...] *I felt drained after making the decision, but my conscious was clean*' (P94, Mass Effect 2, ECC).

However, decisions did not necessarily have to present players with different choices and alternative outcomes to be emotionally challenging. Some experiences involved unavoidable gameplay sequences, such as the infamous 'napalm scene' in Spec Ops: The Line: '*The game shows you all of the civilians that you could end up choosing to burn, and right in the middle you can see a mother holding her child, and it was overall pretty heart wrenching*' (P124, ECC). Other participants even described struggling with simply progressing the game, when they felt that sympathetic characters would suffer: '*I was often almost too afraid to continue because I didn't want Trico to suffer any more harm*' (P54, The Last Guardian, ECC), or '*Continuing the story was hard in some ways for me because*

I knew the end result would be that the people we were taking Ellie to would want to use her to create a cure' (P65, The Last of Us, ECC). Similarly, several players felt emotionally challenged when characters suffered as a consequence of their in-game actions: '*I ended up killing Toriel accidentally, and I was very upset about it. And then towards the end of the game, Toriel's relationships with the other game characters are explained and I felt really bad about what I had done*' (P70, Undertale, ECC). A participant further elaborated that '*seeing that your actions have caused the person you love to be in such pain, and in a wheelchair, made me feel responsible*' (P53, Life is Strange 3, ECC).

Overall, anger, fear, sadness, and tension, were characteristic of this challenge type. Decisions presenting only unwanted outcomes often made participants feel '*pretty powerless, even though I had a choice*' (P55, Life is Strange, ECC), while confronting the consequences of their actions evoked feelings of '*guilt, remorse, and frustration*' (P70, Undertale, ECC). Nevertheless, although negative emotions were prominent, P50 explained that they felt '*happiness that a game could be well-made and elicit such a reaction*' (Dragon Age: Origins, ECC).

Difficult Themes

Emotionally challenging game experiences sometimes confronted participants with difficult and existential themes, such as death, illness, and domestic problems '*making me address themes I've never had to deal with before in a game*' (P134, Firewatch, ECC). This was experienced as particularly challenging when the game narrative '*hit extremely close to home as the situation seemed to mirror that of my own when growing up*' (P75, Child of Light, ECC). Another participant further elaborated that '*an NPC lost a sister, less than a year into me losing my own (real-life) sister. After bawling and processing my grief all over again, I pushed through it and got a little closer to closure by completing the story*' (P151, Guild Wars 2, ECC).

Games also faced players with social issues, such as racism and torture. For instance, a participant explained that in Skyrim she was not allowed to marry any characters of the same in-game race and that '*the racism against my character in Skyrim can be a bit depressing and I irrationally felt like the game developers (in reality) and the laws of the land (in the game) were both discriminating against my character*' (P136, Skyrim, ECC). The torture scene in Grand Theft Auto V was reported by several participants, where '*you had to torture a guy yourself. For me that was very challenging, because I knew, that it was just wrong*' (P76, ECC).

Many participants first expressed shock when faced with those themes, '*I was at first just appalled by the gratuity of the scene*' (P123, Grand Theft Auto V, ECC). Nevertheless, as P123 elaborated, grappling with the meaning behind these scenes enabled them to resolve the initial tension: '*As time went on, I began to appreciate the nuances of the situation, and saw how the government agency was driven by the need to exist, the agents were driven by their need to provide results* [...] *and the whole system was deeply flawed. It made me appreciate why the 'tough times call for tough choices narrative' in the media can actually be not only wrong but harmfully so*' (P123, Grand Theft Auto V, ECC). Indeed, several participants explained that being confronted with difficult themes in games got them thinking about moral matters. For one player, for instance, being accused of being a murderer was so emotionally challenging that '*this situation ripped me out of the gaming flow and restarted a thinking process about good and bad*' (P16, Middle-earth: Shadow of Mordor, ECC). Another participant explained that witnessing the instant death of the player character (i.e., a beetle) raised existential thoughts: '*Beetles, of course, don't worry about that, but as a human being it was emotionally intimidating, the perception, how fast life can be over*' (P37, Bugdom, ECC). Similarly, others saw some kind of take home message: '*It is the realization that this game was describing a real experience, one that people truly felt one day. And it hurts me when I start to think that there were people like Emile, Karl: a father and friend who sacrifices many things* [...]*; a husband who is separated from his loved family and has to fight the entire war on the side that opposes his own wife and father-in-law's country*' (P131, Valiant Hearts: The Great War, ECC)

While players' emotional responses were comparable to those described when facing difficult decisions (i.e., anger, sadness, and fear), feeling lost and lonely was particularly characteristic: '*Sadness, loss, loneliness - empathy for somebody experiencing dementia*' (P57, Firewatch, ECC). Especially, if the game narrative resembled incidents players had to live through in real life, participants emphasized how similar the experienced emotions felt, for instance, '*the game inspired these feelings of uneasiness, confusion, family love and sadness again*' (P110, What Remains of Edith Finch, ECC). A few participants described a blend of both positive *and* negative emotions at the same time: '*It was an overwhelming experience of mix of sadness, awe and pleasure.* [...] *My eyes became wet and I almost cried. And yet I felt an odd kind of pleasure, like I achieved something great. Narration wise and emotionally, it was really a very ambivalent moment*' (P42, Metal Gear Solid 3: Snake Eater, ECC).

When describing experiences that involved difficult themes, participants often praised the quality of the plot and writing, '*It's a perfect game plot-wise*' (P131, Valiant Hearts: The Great War, ECC). However, a few games were criticized when players felt their message was preachy: '*It just made me angry because the game was trying to be preachy but was doing so in an absurd way. To me it's the equivalent of saying that soldiers who fight in battle are murderers because they kill people. It's an ill informed and ignorant argument and made me angry that a video game would try and do something like that*' (P128, BioShock Infinite, ECC). Notably, some participants described their experience as '*probably one of my earliest memories of seeing true Art (with a capital A) in anything*' (P126, EarthBound, ECC), as well as emphasized '*the ability to interactively experience themes as complex as dementia is what makes video games such a powerful artistic medium*' (P57, Firewatch, ECC). Accordingly, appreciation for emotionally challenging experiences involving difficult themes was highest among all challenge types (M=5.89).

Dealing with Intense Negative Emotions

In both conditions, several participants specifically stated that it was challenging for them to deal with the emotions the game had evoked. For instance, some recounted that playing horror themed games was challenging because they had to confront their fear and feelings of uncertainty: '*not knowing what would the man do there on this chair and what would appear next was quite scary!!*' (P5, The Room 2, ECC) or '*using Misery mod is like having a known world become unknown and full of darkness. Like in childhood, when you were alone at home. Everything in this level was a potential threat, therefore it was a very tense experience*' (P59, S.T.A.L.K.E.R.: Call of Pripyat + Misery Mod 2.1, ECC). Others described feeling challenged by experiences of nausea and disgust: '*It* [the game] *had a lot of relatively well-rendered cut scenes that depicted disturbing content. I became sick to my stomach and made an excuse to avoid playing the game through with my friend. I also later had trouble getting to sleep while images were stuck in my head, and I have thought about it several times over the years since*' (P158, [name of game not remembered], ECC).

However, not only horror games evoked such challenging emotions. For instance, one participant described the torture mission in Grand Theft Auto V as '*incredibly upsetting and I switched off the sound and didn't really look at it.* [...] *I was extremely shocked. I wasn't feeling good for some hours. And when I think back, then I'm disappointed, because otherwise I actually like this game, even though it's too brutal. I'm also a bit embarrassed that I didn't stop playing, even though I was so disgusted*' (P46, CC), or the challenge in Papers, Please is '*the stress of the job itself along with the dreary imagery of the people. I hate looking at the screen that shows the status of your family deteriorating...*' (P142, ECC). The same participant further elaborated that they '*find it so stressful that I can't play it for longer than 30 minutes*'. Similarly, a few participants described pausing the game when overwhelmed with emotions: '*I needed a pause every now and then as the game overwhelmed every thirty minutes. My chest was heavy and in the end I cried a little*' (P110, What Remains of Edith Finch, ECC).

Other players struggled dealing with feelings of anger and frustration: '*What made this experience emotionally challenging was my inability to deal with my anger in a healthy way*' (P64, The Legend of Zelda: Twilight Princess, ECC). In such instances '*it becomes increasingly difficult to stay calm and focus on the task at hand without getting 'distracted' by emotions*' (P154, Super Smash Bros., ECC). These emotions were typically evoked by more 'conventional' challenge types (e.g., physical coordination), where being overwhelmed with emotions often impaired players' concentration and performance: '*The game kept frustrating me to an extent where I lost concentration but not the will to keep playing, leading to me getting worse and worse without any actual success*' (P2, Bloodborne, CC). Some participants eventually 'ragequit': '*it was driving me so crazy I stopped playing the game for a few weeks and almost didn't go back to it*' (P47, Portal, CC). Notably, these participants scored their experiences rather low on enjoyment and appreciation (both $M<2.33$, $n=5$).

Social Challenge

Playing competitively against others posed its own set of challenges. Some participants experienced intense negative emotions when they lost to other players: '*I felt very angry at him, as it was his fault that I was last in the race results.* [...] *I think the emotion was more addressed toward the other player than the game itself. Thus the emotion came from the social challenge, more than the difficulty of the game*' (P77, Mario Kart 64, ECC). This was particularly pronounced when players were very fond of the game in question: '*It was really challenging to overcome my own pride to accept that he is better than I am, in a game that I love*' (P8, Gran Turismo, CC). One participant felt that the experience became more challenging through the '*added element of proximity with your direct opponents, allowing (friendly) smack talk to escalate emotional response to in-game events*' (P154, Super Smash Bros., ECC).

However, collaborative play could also be challenging when players struggled with coordination within the team: '*I think the most challenging part of this experience was our failure to cooperate effectively. Our movements and decisions weren't coordinated enough, and we weren't communicating effectively*' (P82, James Bond 007: Everything or Nothing, CC). Such moments led players to turn their negative emotions towards other players, for instance, '*frustration, sometimes anger about the other people playing*' (P40, Overcooked, CC). Some participants were themselves target of other players: '*I was in a raid group with 23 other players when I was newer to this game - I was berated and called names and this was an emotionally challenging experience for me*' (P106, Final Fantasy 14, ECC). Several participants tried to deal with these socially challenging situations by attempting to reassure and motivate their team mates, such as '*trying to calm the person down, but that being to no avail*' (P69, League of Legends, CC), or '*it was hard to get everyone to keep trying and people not to get mad at each other*' (P40, Overcooked, CC). If they succeeded, however, participants expressed joy and happiness: '*While it was very frustrating and difficult to accomplish at the time, looking back on it, I am a bit proud and happy that I had the experience*' (P67, Halo 3, CC), with one participant noting that he '*learned a lot about teamwork and trust*' (P51, World of Warcraft, CC).

DISCUSSION

Our study provides empirical evidence of how players experience emotional challenge in games. In line with Cole et al. [9], we found that players experienced emotional challenge when games confronted them with difficult themes. Additionally, our findings showcase that emotional challenge manifested when players were faced with tough in-game decisions with no discernible positive outcome, or had to deal with intense negative emotions. But emotional challenge was not exclusive to solitary play, as multiplayer games also challenged participants emotionally when they had to control their anger directed towards others or had to reassure players who were themselves overwhelmed with emotion. In contrast to more conventional challenge, which was dominated by feelings of frustration followed by positive emotions such as

joy, our results further highlight that emotional challenge evoked a range of negative emotions, such as anger, sadness, and fear. Nevertheless, emotionally challenging experiences with the exceptions of ragequitting experiences – were appreciated significantly more.

While no causal inferences may be drawn due to the exploratory nature of the present study, our findings nevertheless outline different ways how games may afford emotional challenge, as well as how they provide player experiences distinct from more conventional types of challenge. In the following, we discuss the implications of our findings with regards to the design and evaluation of emotional challenge in games.

Types of Emotional Challenge

Our findings revealed that there is not 'one' emotional challenge, but rather different ways it may come about in games. First, in line with Cole et al. [9], participants experienced confronting difficult themes as emotionally challenging. Our findings further suggest that difficult themes pertain to subject matters that players rarely encountered in games, or challenged players' convictions, which often left them feeling lost and lonely. This seemed especially pronounced, when the game narrative mirrored instances of their own life, similar to the findings of Bopp et al. [6], where players were emotionally moved when their game experience reminded them of instances of personal loss. Yet the qualitative data suggests that by confronting such difficult themes (e.g., World War I in Valiant Hearts) participants could derive personally meaningful insights (e.g., all sides suffer from war) [9, 32], as likely reflected in the high appreciation scores [3, 14].

Indeed, some players (e.g., P123 playing GTAV) initially perceived certain scenes as gratuitous, yet appreciated the deeper meaning they saw in it [4]. Depicting difficult themes, however, does not invariably make for a compelling game experience. Some instances in our study (e.g., P128 playing BioShock Infinite), as well as the recent controversy surrounding the depiction of domestic abuse in the trailer of *Detroit: Become Human* [36], indicate that if perceived as overly blunt, some players may consider a game's depiction of difficult themes as preachy or in bad taste. A more ambiguous narrative [9] might perhaps encourage players to construct their own meaning and inspire appreciation of a game's themes [3, 4].

Second, in contrast to movie experiences, games did not just passively confront players with difficult themes, but often demanded them to act. Similar to Benford et al. [5], having players themselves take on difficult decisions made for uncomfortable and emotionally challenging experiences. While Cole et al. emphasized the role of ambiguity with regards to game objectives and narrative [9], our findings further showcase that ambiguity is in parts also key for emotionally challenging decisions. These decisions either lacked clear-cut best (or least bad) options, or had all options clearly linked to unwanted consequences, forcing players to reflect on their choices – often even after the decision had been taken. Interestingly, one participant stressed that the lack of a time limit in Walking Dead made the decision even more stressful, perhaps because it left them ample time to ponder their choice rather than pressure them into a knee-jerk reaction. These findings might be of particular interest when designing games for raising awareness about serious issues [15, 29], as presenting players with difficult and ambiguous decisions may facilitate reflection.

Some in-game decisions (e.g., Papers Please) actually presented players with clear best options with regards to gameplay, but pitted them against players' personal convictions. This suggests that while emotional and functional challenge need not always be mutually exclusive (cf., [9]), they may still be antagonistic to a certain extent. Hence, one interesting avenue for future research could be to further investigate the tension between emotional and functional challenge. For instance, by experimentally comparing game experiences that are emotionally challenging, but low on functional challenge (e.g., a game depicting the horrors of war, but featuring easy combat), with experiences that feature both emotional and functional challenge (e.g., involving much more difficult combat).

Additionally, participants also experienced confronting the negative consequences of their previous in-game actions as emotionally challenging, especially when a character they cared for suffered as a result of it, underlining the importance of identification with game characters [6, 16]. As suggested by Jørgensen [21], emphasizing the negative consequences of players' actions may have helped establish a sense of complicity in players, which threatened their emotional safety, yet also invoked a positive discomfort of sorts. In contrast to movies, this sense of complicity is a unique 'device' of games [22] and likely facilitated players' experience of intense negative emotions, such as shock, embarrassment, and stress.

Third, participants described that dealing with these intense and usually negative emotions constituted in itself an emotional challenge. Horror-themed games, in particular, challenged players by evoking strong feelings of fear and uncertainty about what will await them next, resembling Bartsch and Hartmann's notion of affective challenge in horror movies [3, 14]. But grappling with difficult themes and decisions also led some players to become overwhelmed with emotion, sometimes to an extent that they had to take breaks. Other players were emotionally challenged when dealing with their anger and frustration, lest it impair their concentration and subsequent performance. When they failed to do so, several indicated that they had ragequit the game or gotten angry at their team mates. While Cole et al. noted that functional challenge may undermine emotional challenge in games [9], our findings highlight that intense emotions may in turn distract players from successfully overcoming functional challenges. Moreover, while these findings underline the potential for games to support emotional learning by confronting players with stressful situations (e.g., Lobel et al. employed a horror game to train emotion regulation [27]), they also indicate that for these types of games it is crucial to create the 'right sort of experience' that is not too overwhelming [40].

Differentiating Emotional and Conventional Challenge

In contrast to challenging experiences, we found that emotional challenge was characterized by more diverse negative emotions. Nevertheless, with the exception of ragequitting instances, emotionally challenging experiences were ap-

preciated significantly more, lending further support to the notion that players often do value emotionally complex experiences [6, 16] that go beyond the frustration/fiero-cycle characteristic of conventional challenge. In contrast, emotional challenge was perceived to be significantly less challenging, less cognitively involving and less immersive. On the one hand, this comes to little surprise as emotional challenge in games usually demands less dexterity or strategic thinking from players [9], which might also account for why participants in both conditions felt competent to similar degrees. On the other hand, this raises the issue of how to conceptualize (and evaluate) emotional challenge, as several participants in the present study noted difficulties answering the IEQ with regards to an emotionally challenging experience. Contrary to conventional notions of challenge in games, our findings show that emotionally challenging experiences seldomly presented players with clear 'win' conditions and participants questioned their 'performing well', unless it involved 'performing well' in relation to thinking about the game's message.

Similarly, one may ask what constitutes 'skill' when tackling emotional challenge? Previous work claimed that emotional challenge in games cannot be overcome by skill [9, 11]. Yet our findings suggest that this might not be as clear-cut. Skill seems not relevant when players face tough decisions with no discernible positive outcomes. With regards to confronting difficult themes, skill might perhaps entail whether and how successfully players reflect on and make meaning of the situations presented in the game. Dealing with intense negative emotions, in contrast, clearly requires emotional competencies, which can be trained [27, 40].

Taken together, our findings highlight that emotional challenge not only evokes different experiences than physical or cognitive challenge, but that in many ways it runs counter to key concepts characteristic of conventional challenge. This indicates that existing measures of challenge may not adequately account for emotional challenge and highlights the need for a new evaluation tool that covers the whole range of challenge in games [11]. A measure for emotional challenge might, for instance, include items that assess players' cognitive involvement with the themes and narrative of the game [3, 9] instead of how much they want to win – or similar to the scale of Wirth et al. [44] ask whether players were challenged by the emotions they felt while playing.

Limitations and Future Research

First, it is important to note that due to the exploratory nature of the present study, no causal relationships may be inferred. Still, the present study identified several types of emotional challenge, as well as game design aspects that might facilitate such experiences, which may serve to inform future empirical work. For instance, it would be interesting to further unpack the different types of emotional challenge in experimental studies, similar to the ones conducted by Cox et al. [10].

Second, the present study had participants retrospectively describe a (emotionally) challenging experience. While we aimed to reduce potential bias through a guided recall process and asking participants to write about their experience, it might still differ from their in-the-moment experience [23]. However, as memories of an experience are considered to be relatively stable [23] and we were particularly interested in how players interpreted their experience, we felt this was a fitting approach for our research question. Nevertheless, future studies should look into players' moment-to-moment experience with emotional challenge, especially with regards to how they cope with difficult themes. Next, due to the wording of the open-ended question, participants in the emotionally challenging condition likely were prompted to focus more on their emotional experience. Still, participants in the challenging condition reported just as many (albeit less varied) emotions as those in emotionally challenging condition.

Third, the majority of reported titles were AAA games. While emotional challenge was said to be particularly characteristic of avant-garde games [9], our findings support Cole's et al. [9] argument that some AAA games may also exhibit such qualities. Similarly, some games (e.g., The Witcher 3) were mentioned in both conditions. To further deepen our understanding of emotional challenge in games, it may hence prove particularly insightful to specifically study avant-garde game players, as they might have specific motivations for engaging with such experiences.

Finally, while only few participants reported having ragequit the game, they rated their experience substantially lower in enjoyment and appreciation. This clearly indicates that not all emotionally challenging experiences are positive, and that overwhelming feelings of anger and frustration may ruin the player experience. It is therefore important to further investigate how games evoke experiences that may be uncomfortable but worthwhile [5, 6, 8, 21, 30, 32], as well as what other factors influence whether players value such experiences.

CONCLUSION

Emotional challenge has been suggested to afford more unique and diverse gaming experiences, beyond traditional notions of challenge in games. Yet the concept has to date never been empirically studied. We analyzed 171 players' accounts of either challenging or emotionally challenging experiences. Players reported being emotionally challenged by confronting difficult themes, grappling with tough in-game decisions, and by having to keep in control of their own intense negative emotions. Compared to more 'conventional' notions of challenge, emotional challenge evoked a wider range of negative emotions, but was nevertheless well received by most players. Moreover, our findings suggest that several core aspects of conventional challenge do not readily apply to emotional challenge. Taken together, our findings highlight the appeal of uncomfortable player experiences, and extend our understanding of (emotional) challenge in games.

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