

# A Good Reason to Die: How Avatar Death and High Challenges Enable Positive Experiences

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## ABSTRACT

Appropriate challenges and challenge-skill balance are usually key to positive player experiences. However, some games such as the successful series *Dark Souls* are notorious for their excessive difficulty. Yet, there has been little empirical investigation of why players enjoy games they constantly struggle and fail with. We surveyed 95 participants right after the release of *Dark Souls III* about their experiences with the game, employing both open questions and different player experience measures. Players generally enjoyed challenging play sessions and mostly reported positive experiences, with achievement and learning moments strongly contributing to positive experiences. However, these factors themselves were enabled by negative events such as difficulties and avatar death. Our findings showcase that negative events bear a potential for forming positive and meaningful experiences, thus expanding previous knowledge about the role of challenge and failing in games. Moreover, the significance of hard-earned achievements extends present design conventions.

## ACM Classification Keywords

J.4 Social and Behavioral Sciences: Sociology, Psychology;  
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## Author Keywords

Games; Player Experience; Failure; Challenge; Avatar Death; Enjoyment

## INTRODUCTION

Video games are played for the interactive experience they provide. Challenge is ubiquitously seen as one of the most important components of this experience: an unchallenging game will likely be perceived as shallow or boring and thus might not be a particularly enjoyable experience [19, 23, 36, 38]. Although challenge and competition have been found to increase enjoyment in general [27, 34, 42], they can also be excessive and lead to negative experiences when players fail and feel less competent [35]. According to the theory of flow [11], a key characteristic of an optimal experience is the

balance between challenge and skill. Hence, if challenge demands imposed by the game are too high or too low in regard to the player's skill level, playing the game leads to anxiety or boredom. The significance of an ideal challenge-skill balance is strongly emphasized in current research [3, 4, 13, 23, 33, 37], where adjustable and adaptive difficulty mechanics play an integral part in keeping this balance [8, 14, 35, 39]. Moreover, balance and accessibility represent two key notions of the *casual revolution*, a design trend towards making games more accessible by removing perceived barriers, penalties and frustrations and targeting much broader audiences than games used to over roughly a decade ago [20, 22]. In conclusion, challenge in current literature and modern game design has to a large extent been treated as a *Goldilocks factor*: The difficulty of a game should be neither too demanding nor too low in order to avoid negative experiences and frustrations.

In light of present design conventions, some exceptional games stand out, ignoring most of the conventional balancing efforts by implementing very high challenges and high consequential avatar death in their core design: For example, the popular action role-play series *Dark Souls*, which became notorious for its high difficulty as well as for its harsh penalties resulting from failure. The series in some respects acts the complete opposite way in comparison to the above mentioned trends: Challenges and demands imposed by the game are steep from the very beginning and players will constantly fail throughout the progression of the game. There are neither adaptive mechanics nor adjustable difficulty levels and still, the game series gained increasing popularity over the last years [30].

Although the appeal of punishing or unfair games has received some attention in current research [2, 27, 43], empirical evidence is yet scarce. Given the crucial role of challenge-skill balance in shaping positive experiences, we aim to examine this seemingly contradictory situation of players enjoying a game defined by high challenges, numerous frustrations and punishing avatar death. We therefore asked 95 participants to report an outstanding experience with *Dark Souls III* right after the release of the game. Participants were split in two groups, depending on whether they reported a positive or negative experience. By analyzing experience reports and employing various psychometric scales, we explored common gameplay themes and events, how they are associated with each other and how they contribute to positive experiences. Our findings suggest that negative events such as avatar death and difficulties bear a potential for enabling positive experiences. Moreover, we identified moments of learning and achievement, evoked and characterized by failures and difficulties, as being crucial

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for positive experiences in this context. We thus extend our notion of a positive experience by reflecting on how closely related they are to negative events.

## RELATED WORK

### Challenge in *Dark Souls III*

In *Dark Souls III* the player explores a fantasy world, consisting of continuous interconnected areas, while facing different types of enemies. The better part of its difficulty stems from engaging in combat with enemies, adapting to their varying combat patterns and finding the right strategy to defeat them. Especially larger opponents (boss fights) usually take multiple attempts in order to find out how to dodge their attacks, to identify their weak spots and defeat them. Avatar death in *Dark Souls III* is highly consequential to the player, unlike a vast majority of modern games where death merely is a minor setback [2, 10]. With failure the player loses all their souls (experience points) and respawns often at a distant place from his or her previous death, thus being forced to play a large section of the game all over again. If the player dies again before retrieving their souls from the location of their last death, all experience points are gone for good. Hence, death can result in a loss of hours of game play and immense frustration. Frequent avatar death is a core element of *Dark Souls III* due to its high difficulty.

### Avatar Death

Avatar death typically serves as a game mechanic, which is used to mark the player's failure and temporary removal from play and occurs in most genres of video games [7]. The mechanic imposes a penalty on the player, consisting of repetition and incremental progress towards mastery of a certain section of the game [12]. Avatar death thus may result in an immediate negative experience, depending on how punishing the consequences for the player are. The role of a highly consequential death mechanic has been examined in two studies on the game *DayZ*, where every avatar death forces the player to restart the game from the beginning. Carter et al. [7] examined how this consequentiality affects the players' experience and behavior in the game and concluded that it leads to intensified social interactions, moral dilemmas and a raised level of perceived investment. Allison et al. [2] found similar results, concluding that the awareness of risks imbues actions with meaning and that this meaningfulness stems from a pattern of smaller negative experiences. Achievements therefore led to extremely positive emotions, because the player is aware of the high stakes the game imposes on them. Players considered the high consequentiality as a frustrating, although crucial component for the enjoyment of the game. Allison et al. [2] further stated that negative and positive affect are not mutually exclusive: the positive experience is directly created by negative feelings of fear, anxiety and unpredictability. Accordingly, avatar death is accompanied by a short-term negative affect but ultimately leads to a positive experience, if the player is able to achieve his or her goal. Avatar death and failure are often depicted as part of a learning process. Flynn-Jones [12] describes in-game death and its current loss of control as a recurring process of agency (getting back control after death), repetition and ultimately mastery of a certain section of the game. This is much

in the same vein as Juul [18], stating that in-game death is the death you survive and learn from. Furthermore, death motivates players to meet challenges by learning how to overcome failure [22], thus making death and failure a recurring, informing learning process, critical to the enjoyment of a videogame [12, 18, 24, 26]. As stated by Iacovides et al. [15], challenges provide players with potential opportunities to learn, although moments of learning only occur if a breakdown (caused by challenges) leads to a breakthrough in understanding.

### High challenges and enjoyment

Avatar death may play a substantial part in forming positive experiences through achievements and learning moments. However, excessive challenges are more often portrayed in literature as a negative factor for enjoyment [25, 35], which has to be throttled and adjusted to the player through adaptive difficulty mechanics [8, 14, 31, 39, 44]. Dynamic difficulty adjustments (DDA) such as auto-aim function in combat games, adaptive AI, or the rubber band adjustment in racing games help less skilled players to stay competitive and to succeed in achieving their goals [8, 14, 35, 39]. Studies show that adaptive mechanics are especially preferred by novices to feel more competent, autonomous and related to other players [8]. In addition, their implementation is perceived as a measure to make the game more enjoyable [41] and support flow [9].

A closer look at current research revolving around difficulty and enjoyment illustrates the emphasis on the importance of balanced or generally lowered difficulty settings: Schmierbach et al. [35] examined the relationship between difficulty and enjoyment and possible mediating roles of competence (as defined in self-determination-theory, [34]) and challenge-skill balance [11]. Results showed that individuals playing a harder version of a game felt less competent, reducing their sense of challenge-skill balance, which in turn diminished their enjoyment. In a similar vein, Klimmt et al. [25] found that even experienced players reported greater enjoyment and satisfaction when playing a shooter game in an easy mode, compared to medium or hard settings. Though Alexander et al. [1] put this finding into perspective by showcasing that only casual players enjoy lower difficulty settings more, regardless of their abilities, while experienced players prefer challenges according to their skill level. Furthermore, Jin [17] demonstrated that players who avoided avatar death in their play session, reported higher levels of competence and flow, although the study did not directly include measurements for enjoyment. Another study conducted by Peng et al. [29] showed that players reported greater enjoyment if the game featured adaptive difficulty mechanics, which primarily helped to reduce challenge. Klarkowski et al. [23] also emphasized the importance of an ideally balanced game, which is associated with heightened positive affect and higher enjoyment as well as heightened feelings of autonomy and relatedness, when compared to high and low challenge settings. Players furthermore seem to prefer lower levels of difficulty at the beginning of a game [25].

In conclusion, excessive challenges in games are typically associated with lower enjoyment or fun [13, 35], lowered positive and heightened negative affect as well as lowered feelings

of competence, autonomy and relatedness [23]. However, some articles also discussed the appeal of highly challenging or unfair and punishing games. Lazzaro [27] states that effort and frustrations are needed in order to reach the *fiero* state: A personal triumph over adversity by overcoming difficult obstacles. She describes it as hard fun, a type of gameplay, which revolves around achieving goals. Similar to Allison et al.'s study [2] on *DayZ*, achievements represent a central aspect in this theory. Wilson & Sicart [43] argue that unfair games can be funny *because* they are user-unfriendly and break every good-practice level-design rule. The player is in on the joke and realizes that the game designer is basically mocking him or her, while accepting this challenge as a contest between him and the creators. Games like these may thus be not functional per se but they enhance interpersonal aspects and allow for new experiences, which enable unusual ways of enjoyment.

In summary, while current research provides some valuable insights into the role of avatar death and high challenges in video games, some questions still remain open. Avatar death might play an important role for the fun in high challenging games, though these findings mostly come from theoretical works and empiric evidence is yet scarce. Moreover, literature mostly points in a direction where excessive challenges are detrimental to the players' enjoyment, even though the popularity of games like *Dark Souls* or *Super Meat Boy* contradicts or at least relativizes such findings. Therefore, the present study aims for a better understanding of the role of avatar death and high challenges in positive player experiences. The central questions are, if players enjoy high-challenging games despite occurring difficulties and failures, or if avatar death and high challenges actually may form and enable positive experiences. We thus conducted an online-survey, applying a combination of qualitative and quantitative methods. Several psychometric scales and open-ended questions were utilized in order to analyze participants' latest outstanding experiences with the game *Dark Souls III*.

## METHOD

Participants of this study were asked to report an outstanding positive or negative experience in their recent play-session of *Dark Souls III*. This critical incident method allows collecting and combining qualitative and quantitative data and is focused on what the players themselves consider a positive or negative experience.

### Participants

The study was distributed on several gaming forums (e.g., Steam), social networks (e.g., Facebook, Twitter, VKontakte), as well as gaming-related groups on Reddit and Facebook. The age of the 95 participants (4.2% female) who completed the survey in entirety ranged from 13 to 42 years ( $M = 23.81$ ). On average, participants had been playing *Dark Souls III* for 41.83 hours (ranging from less than 1 hour to up to 346 hours) with half of the participants having played 23 hours or less. Apart from 4 participants, all respondents indicated that they had at least a little experience with any of the previous games of the series (*Dark Souls I* or *II*). In exchange for completing the survey, participants could enter a lottery to win a \$100 or one of four \$25 (USD) Amazon gift cards.

## Procedure

The online survey consisted of both qualitative, open-ended questions, as well as several scales. The open-ended questions followed a similar approach as Bopp et al. [5]. The first open-ended question was as follows: "*Bring to mind an outstanding positive or negative experience you had in your most recent game-session in Dark Souls III*". Additionally, they were asked to try to describe this particular experience as accurately, detailed and concrete as possible. Participants had to write down at least 50 words. Afterwards, participants were asked to clarify the cause of the thoughts and feelings they had in their experience.

After answering the open-ended questions, participants had to rate their experience in terms of positive and negative affect, need fulfillment, challenge, challenge-skill balance and enjoyment. Finally, they were asked to provide some information on demographics and experience with the previous games of the series. At the end of the survey, participants could enter their email address if they wished to participate in the prize raffle. The survey took on average 21.9 minutes to complete.

## Thematic analysis of experience reports

The open-ended answers were manually coded following the thematic analysis protocol [6] to identify recurring themes. The most common themes identified were *achievements & victories*, *learning & improvement*, *difficulties & failures*, *lack of progress* and *enemy encounters*. The meaning of these categories is described in-depth in the results section.

The first author coded all open-ended answers. To assure interrater reliability, an independent rater coded a random subset of 41 experiences. After the category *lack of progress* was dropped, due to low agreement among the raters, a substantial agreement among the raters for all themes ( $\kappa = .6$ ) was achieved.

### Overall valence of the experience

The overall valence of the experience was coded either positive or negative on a whole-experience level. The interrater agreement was substantial ( $\kappa = .65$ ). There were several experiences that included negative events, such as avatar death, but ultimately depicted a positive outcome, such as overcoming these challenges and reporting satisfaction. The overall valence was coded positive, if the play session was mainly described with positive outcomes such as joy, satisfaction, happiness, and positivity.

*'A really outstanding experience I had during Dark Souls III would be, when I finally beat the Soul of Cinder after many attempts and the credits rolled. I can say this was a positive experience.'* (P1023)

*'The first time I defeated the boss The Nameless King was an overwhelmingly positive experience.'* (P1236)

*'It's a phenomenal experience succeeding at fighting enemies I previously struggled with, using a much more powerful character.'* (P1510)

Theme	Overall (N = 95)	Positive (n = 57)	Negative (n = 38)	$\chi^2$	p
<b>Achievements &amp; Victories</b>	58 (61%)	<b>45 (79%)</b>	<b>13 (34%)</b>	<b>17.355</b>	<b>&lt; .001</b>
<b>Learning &amp; Improvement</b>	43 (45%)	<b>37 (65%)</b>	<b>6 (16%)</b>	<b>20.268</b>	<b>&lt; .001</b>
Difficulties & Failures	78 (82%)	49 (86%)	29 (76%)	0.863	.353
Enemy Encounters	64 (67%)	43 (75%)	21 (55%)	3.354	.067

**Table 1.** The overall absolute and relative frequencies of the identified themes are depicted in the second column. In the third and fourth column these frequencies are split by valence of the experience (positive and negative) and tested for statistical significant differences with Pearson's Chi-squared tests with Yates' continuity correction. Themes with statistical significant differences are shown in bold.

The overall valence was coded negative, if the play session was mainly described with negative outcomes such as frustrations, anger or general negativity:

*'I was hit by a special attack and died right before I was able to kill them. It was a terribly negative experience.'* (P1410)

*'Ultimately the feelings boiled down to excitement, anger, and disappointment.'* (P643)

### Measures

To investigate the role of affect, competence, challenge and challenge-skill balance, several scales were included. All measures employed 7-point Likert scales ranging from strongly disagree (1) to strongly agree (7).

#### Positive and negative affect

The general affective quality of the experiences was assessed with the International Positive and Negative Affect Schedule Short Form (I-PANAS-SF; [40]). It is widely used to measure strong positive ( $M = 5.51$ ,  $SD = 1.11$ , Cronbach's  $\alpha = .74$ ) and negative ( $M = 3.13$ ,  $SD = 1.18$ , Cronbach's  $\alpha = .60$ ) affective states.

#### Player Experience Need Satisfaction

The Player Experience Need Satisfaction scale (PENS; [34]), was used to examine the role of autonomy ( $M = 5.65$ ,  $SD = 1.23$ , Cronbach's  $\alpha = .83$ ), competence ( $M = 5.42$ ,  $SD = 1.16$ , Cronbach's  $\alpha = .71$ ), and relatedness ( $M = 4.19$ ,  $SD = 1.49$ , Cronbach's  $\alpha = .74$ ) with three items each, as already done in previous PX research (e.g., [5]).

#### Challenge

Perceived challenge of the situation ( $M = 5.85$ ,  $SD = 1.15$ , Cronbach's  $\alpha = .85$ ) was measured with the 5 items for challenge adapted from the Game Experience Questionnaire [16]. This subscale included items such as *'I thought it was hard'* and *'I had to put a lot of effort into it'*.

#### Challenge-Skill Balance

Challenge-Skill Balance ( $M = 5.72$ ,  $SD = 1.03$ , Cronbach's  $\alpha = .62$ ) was measured as agreement on the 3-item scale developed by Schmierbach et al. [35]: *'I was challenged, but I believed my skills would allow me to meet the challenge'*, *'My abilities matched the challenge of the situation'*, and *'The game kept me on my toes but did not overwhelm me.'*

#### Enjoyment

Enjoyment ( $M = 6.56$ ,  $SD = 0.98$ , Cronbach's  $\alpha = .95$ ) was measured using a 3-item scale, originally developed and validated by Oliver and Bartsch [28]. Participants indicated agree-

ment on the following statements *'It was fun for me to play'*, *'I had a good time playing'*, and *'The experience was entertaining'*.

## RESULTS

### Overall frequencies of themes and overall valence

Taken together, the identified themes *achievements & victories*, *learning & improvement*, *difficulties & failures*, *lack of progress* and *enemy encounters* made up 87.8% of all reports, thus covering the most substantial part of all experiences. The overall frequency of each theme is depicted in Table 1. Out of the 95 experiences, 57 (60%) were coded as overall positive and 38 (40%) as an overall negative experience. This coding was used in the subsequent analysis to investigate characteristics of positive in comparison to negative overall experiences. The identified themes are described in the following section.

### Themes of experience reports

The coding of open-ended answers identified the following themes, which hereby will be described in detail with the help of excerpts from player reports.

#### Achievements & Victories

Moments of *achievements & victories* were reported by 61% of all participants. Players typically reported these moments after defeating a boss-enemy or after a standard enemy-encounter: *'I slowly whittled the life from this evil force until I was victorious. A great feeling of joy and accomplishment washed over me and a sigh of relief left my lips.'* (P532)

Very rarely participants reported an achievement outside the context of a fight: *'I finally got the dragon head and torso stones for the first time in a souls-game [...] There is no joy like the satisfaction of finally getting to do something that you've waited to do for years.'* (P1293)

In the vast majority of all player reports about moments of *achievements & victories*, participants described their success in contrast to the high challenges imposed by the game, the unpredictability of outcomes and previous deaths and consequences experienced within their play session.

*'I was so excited and so happy... The feeling you get after some tries, when you start to think something is just impossible and then you get through a difficult part of the game... That feeling is indescribable.'* (P521)

*'I was very close to death but I managed to defeat him as he was in the animation of swinging his weapon, which would have certainly killed me.'* (P1236)

Scale	Positive valence (n = 57)				Negative valence (n = 38)			
	Mean	SD	Median	Range	Mean	SD	Median	Range
Positive affect <sup>1</sup>	5.93	0.75	6	4.2 - 7	4.88	1.28	4.8	1 - 7
Negative affect <sup>1</sup>	3.05	1.13	3	1 - 6	3.25	1.26	3	1.4 - 6.2
Competence <sup>2</sup>	5.79	0.77	6	4 - 7	4.87	1.41	5	1.67 - 7
Autonomy <sup>2</sup>	5.76	0.96	6	3 - 7	5.48	1.55	6	1 - 7
Relatedness <sup>2</sup>	4.45	1.33	4.67	1.33 - 7	3.81	1.58	6	1 - 7
Challenge <sup>3</sup>	6.17	0.76	6.2	3.8 - 7	5.38	1.46	6	1.8 - 7
Challenge-skill balance <sup>4</sup>	5.96	0.86	6	3.33 - 7	5.35	1.15	5.67	2.33 - 7
Enjoyment <sup>5</sup>	6.87	0.37	7	5 - 7	6.11	1.38	6.83	1 - 7

Table 2. Mean, standard deviation, median and range of player experience scales for experiences split by valence of the experience. Item sources: <sup>1</sup>I-PANAS-SF [40], <sup>2</sup>PENS [34], <sup>3</sup>GEQ [16], <sup>4</sup>Schmierbach et al. [35] and <sup>5</sup>Oliver and Bartsch [28].

Another remarkable characteristic of *achievements & victories* was their depiction in the light of fear and anxiety:

*‘So far every souls-game makes me afraid of not knowing where to go and to know that you can lose your progress any time. This is especially pointed out in Dark Souls III. It makes you so angry, whenever you die from a boss after trying to beat him for like 20 minutes, but afterwards you just go for it and eventually complete it and that is the best feeling in the game!’* (P1141)

*‘After several hours of trying, I finally beat the Soul of Cinder, and it was absolutely the best feeling I ever had in Dark Souls III. It was a big relief, I felt anxious and scared at the same time, but in a positive way. I mean it’s as if you’re accomplishing something big, like getting a degree.’* (P870)

*‘I was afraid and not knowing if I will survive because of this new mechanic where an enemy evolves into a horrific being, which is something I would never have expected. But I felt proud of my feats, because they were against seemingly impossible odds.’* (P532)

#### Learning & Improvement

Moments of *learning & improvement* were reported by 45% of all participants. These reports typically contained narrations of figuring out certain techniques, strategies or combat patterns in order to progress within the game. For example: *‘To have learnt the basics of parrying in such a short time frame made me feel really good about myself.’* (P1160)

*‘I learned the right timing to evade his attacks, the right time frame to bring in a few hits myself and when to step back and heal.’* (P1060)

Moreover, moments of *learning & improvement* were typically evoked by avatar death, challenging moments and difficulties in general.

*‘Obviously I died a lot, but every time I learned something new.’* (P1060)

*‘My best experience yet was when I fought the Dancer of the Boreal Valley. It took me a total of 6 hours attempting to beat her [...] once I beat her, there has been no better feeling of satisfaction than seeing her hit the ground [...] I refused to*

*watch strategy videos and learned all of her mechanics alone.’* (P1182)

#### Difficulties & Failures

Moments of *difficulties & failures* were reported by 82% of all participants, thus making this theme the most frequently reported. Narrations of *difficulties & failures* typically contained occurrences of avatar death, failed attempts to beat a boss, struggle from difficult gameplay and coping with high challenges.

*‘We died to Yhorm (boss-enemy) since neither of us knew about the storm-ruler sword.’* (P1425)

*‘I came up to the Dancer of the Boreal Valley boss, and I spent half an hour figuring out its spinning and the one-hit-kill grab attack. That horrible thing sighs in a peculiar way, and then lunges forward with a horizontal grab. If the grab connects, she picks me up and sticks her sword down through me.’* (P1164)

As previously depicted, *difficulties & failures* were often reported in context of *achievements & victories* and moments of *learning & improvement*.

#### Enemy Encounters

*Enemy Encounters* were reported by 67% of all participants. These reports typically contained narrations about a boss fight or a regular enemy in the game.

*‘So I am off killing Nazguls left and right and eventually make my way to the first boss.’* (P54)

*‘I was engaged in combat with a hollowed soldier, equipped with a spear and a metal greatshield.’* (P194)

*‘I found a pretty hard enemy, which I didn’t feel like fighting.’* (P254)

As previously depicted in the sections *Achievements & Victories*, *Learning & Improvement* and *Difficulties & Failures*, reports of *enemy encounters* often led to challenging gameplay moments, eventually leading to victory or failure of the player.

#### Interrelation of themes

Some of the participants’ reports clearly showed a strong interrelation among all themes:

*'The process most of the time looks like this: Feeling pumped for having reached a new boss fight, getting angry because that boss is impossible to defeat, starting to learn the bosses attacks and routines, getting nervous and nearly having a panic attack when getting the boss' health bar below 50%, defeating the boss, feeling wrecked but also happy for having accomplished something truly challenging.'* (P751)

This narration of a participant demonstrates, how *achievements & victories*, *moments of learning & improvement*, *difficulties & failures* and *enemy encounters* are intertwined. However, there were a few experiences that did not fit in these categories. For example, this player described his or her admiration of the game world: *'Opening the doors to the High Wall of Lothric took my breath away, knowing that you could go practically anywhere from here. I stood there and just looked at the scenery for 5 minutes.'* (P1050)

Or a different player who felt lost in the game world, but also fascinated and inspired at the same time: *'But my first experience can only be described as finally arriving to a far off land, searching for my purpose. A sense of awe and fear stuck with me through my time with this game. I felt enthralled and on the edge constantly, never taking a second for a break on my quest.'* (P70)

The interrelation and frequency of themes split by valence will be reported in the next section.

### Themes in positive and negative experiences

The frequency of each theme is shown split by valence in Table 1 to describe which themes are associated with a positive valence. Results of the Pearson Chi-squared tests with Yates' continuity correction show significantly more observations of *achievements & victories* ( $\chi^2 = 17.36$ ,  $p < .001$ ) and *learning & improvement* ( $\chi^2 = 20.27$ ,  $p < .001$ ) in positive than in negative experiences. However, *difficulties & failures* and *enemy encounters* did not occur significantly more often in positive than in negative experiences (see Table 1).

#### Achievements & Victories and Difficulties & Failures

A more detailed analysis showed that *difficulties & failures* occurred significantly more often (55 of 58; 95%) in experiences of *achievements & victories* than in experiences that did not report *achievements & victories* (23 of 37; 62%),  $\chi^2_{df=1} = 14.26$ ,  $p < .001$ .

#### Learning & Improvement and Difficulties & Failures

The theme *difficulties & failures* occurred significantly more often (41 of 43; 95%) in experiences of *learning & improvement* than in experiences that did not report *learning & improvement* (37 of 52; 71%),  $\chi^2_{df=1} = 7.8$ ,  $p < .01$ .

#### Analysis of player experience measures

To investigate whether the difference between overall positive and negative experience reports was mirrored in the quantitative measures, the data was split by valence. Descriptive statistics of these two groups are shown in Table 2. To increase the robustness of the results, the groups were compared on an ordinal scale with Mann-Whitney U tests.

#### Positive and Negative Affect

Positive affect was greater in overall positive experiences ( $Mdn = 6$ ) than in overall negative experiences ( $Mdn = 4.8$ ),  $Z = 4.30$ ,  $p < .001$ ,  $r = .44$ . This reflects the qualitative analysis, but also shows that experiences with a negative valence were still accompanied with relatively high positive affect. However, no significant differences in negative affect were found between positive ( $Mdn = 3$ ) and negative experiences ( $Mdn = 3$ ). This shows that even when players did report a negative outcome in the narrative, such as when they were constantly failing in a fight against a boss, these experiences were still rated as positive.

#### Player Experience Need Satisfaction

Competence need satisfaction was greater in overall positive experiences ( $Mdn = 6$ ) than in overall negative experiences ( $Mdn = 5$ ,  $Z = 3.24$ ,  $p < 0.01$ ,  $r = .33$ ), for relatedness, the differences between positive ( $Mdn = 4.7$ ) and negative (3.7) experiences was marginally significant,  $Z = 1.95$ ,  $p = .052$ ,  $r = 0.20$ . For autonomy, no significant difference between the groups (both  $Mdn = 6$ ) was observed.

#### Challenge-skill balance

Data showed that challenge-skill balance was greater in overall positive experiences ( $Mdn = 6$ ) than in overall negative experiences ( $Mdn = 5.7$ ),  $Z = 2.53$ ,  $p < .05$ ,  $r = .26$ . However, in both groups the perceived balance was very high, showing that although many players reported difficulties and failures, the challenge of the game was still perceived as very well matched with their skill.

#### Challenge

Investigating the level of perceived challenge isolated from challenge-skill balance, data showed that challenge was greater in overall positive experiences ( $Mdn = 6.2$ ) than in overall negative experiences ( $Mdn = 6$ ),  $Z = 2.56$ ,  $p < .05$ ,  $r = .26$ . Again, in both groups the last game-session was perceived as highly challenging, with only a marginal difference between them.

#### Enjoyment

Enjoyment was very high for overall positive experiences ( $Mdn = 7$ ) and overall negative experiences ( $Mdn = 6.8$ ),  $Z = 3.75$ ,  $p < .001$ ,  $r = .38$ . Although this difference is statistically significant, it shows that even negative experiences in the end were perceived as enjoyable.

#### Prediction of overall valence

A binomial logistic regression was used to identify important predictors for the valence of the experience among qualitative (the 4 themes) and quantitative variables, as well as to gain an understanding of their relative importance. As depicted in Table 3, results show that *achievements & victories* and *learning & improvement* are the only significant predictors in the model. The odds ratio for these predictors suggest that if *achievements & victories* were reported, the chance was almost 4 times higher that a positive experience occurred than for those experiences that did not report such an event. For *learning & improvement* the relative chance even increased to more than 5 times. Additionally, the results show that neither the PENS subscales, nor measures of challenge or

	Predictor	$\beta$	SE $\beta$	Wald's $\chi^2$	df	$p$	$e^\beta$ (odds ratio)	95% CI of $e^\beta$	
Qualitative	Constant	-0.454	0.619	36.00	1	.85	0.635	0.185	2.182
	<b>Achievements &amp; Victories</b>	1.345	0.685	<b>3.90</b>	<b>1</b>	<b>&lt;.05</b>	3.838	1.025	15.602
	<b>Learning &amp; Improvement</b>	1.615	0.678	<b>5.70</b>	<b>1</b>	<b>&lt;.05</b>	5.030	1.365	20.212
	Difficulties & Failures	-1.064	0.780	1.90	1	.17	0.345	0.070	1.541
	Enemy Encounters	0.486	0.665	0.53	1	.46	1.626	0.435	6.067
Quantitative	Competence	0.589	0.359	2.70	1	.10	1.802	0.918	3.801
	Autonomy	-0.185	0.333	0.31	1	.58	0.831	0.424	1.586
	Relatedness	0.276	0.338	0.67	1	.41	1.318	0.686	2.624
	Challenge-skill balance	0.310	0.327	0.90	1	.34	1.364	0.722	2.633
	Challenge	0.521	0.387	1.80	1	.18	1.683	0.815	3.774
Model fit tests				$\chi^2$	df	$p$			
Overall model evaluation									
Likelihood ratio test				45.34	9	<.001			
Score test				38.68	9	<.001			
Goodness-of-fit test									
Hosmer & Lemeshow				7.43	8	.49			

**Table 3.** Statistics of the binomial logistic regression predicting the valence of the experience (0 = negative, 1 = positive) using the 4 identified themes as nominal predictors and the 5 player experience scales as interval scaled predictors. For each predictor, standardized regression coefficients  $\beta$ , the corresponding standard errors SE  $\beta$  and the results of a Wald  $\chi^2$  test with the degrees of freedom and the corresponding p-value are shown. The Wald tests show that the regression coefficients of the themes *Achievements & Victories* and *Learning & Improvement* are significantly different from 0.  $e^\beta$  depicts the odds ratio of the predictor, i.e. the relative chance of having an experience with a positive valence when the theme appeared in the narrative for qualitative predictors, or, for quantitative predictors, when the rating on the scale increased by 1. The *likelihood ratio test* and the *score test* show a significant improvement of the model fit compared to the null model. The *Hosmer & Lemeshow* test investigates the null hypothesis that observed rates of positive and negative valence is equal for all subgroups of predicted probabilities. Additional model fit statistics and pseudo  $R^2$ : Nagelkerke  $R^2$  (Max rescaled  $R^2$ ) = .513. Kendall's  $\tau$  -  $\alpha$  = .355. Goodman-Kruskal Gamma = .734. Somers's  $D_{xy}$  = .733. c-statistic = 86.6%. Model performance: Accuracy = .82, Precision = .83, Negative predictive value = .80, Sensitivity = .88, Specificity = .74.

challenge-skill balance were significantly predictive for the overall valence of the reported experience.

## DISCUSSION

The aim of this study was to examine factors contributing to a positive experience in a game that is defined by high challenges and countless, punishing avatar deaths. We found that most players rated their experience with *Dark Souls III* as enjoyable, as reflected in the high ratings on enjoyment, positive affect and numerous positive experience reports. A higher challenge was more likely to be associated with positive than with negative experiences, as shown by heightened subjective challenge scores. Reports on *difficulties & failures* however did not significantly differ between the groups, suggesting that they are not an exclusive characteristic of either positive or negative experiences. Positive affect, competence and relatedness were associated with positive reports, whereas negative affect and autonomy did not differ between positive and negative experiences. Furthermore, moments of *achievements & victories* and *learning & improvement* occurred significantly more often in positive experiences. Moreover, these two themes were two important predictors for positive reports, *learning & improvement* being the overall strongest predictor. The vast majority of players in our study reported numerous negative events, which typically have to be avoided in order to progress, *difficulties & failures* being the most frequently mentioned negative event. Avatar death and high challenges thus are a substantial part of the game. As previously mentioned, these seemingly negative events occurred equally often in negative and positive experiences, indicating that even if players experienced *difficulties & failures*, their play session could still be an overall positive experience. Whether players enjoy the game despite facing negative events or if negative events bear

a potential to form a positive experience, is discussed in the following section.

## Learning & Improvement

The first contributor and strongest predictor of a positive experience was *learning & improvement*, supporting the notion that learning makes video games “fun” [26], especially if they provide a lot of complex information and patterns to understand and figure out. A closer look at how *learning & improvement* emerged in *Dark Souls III* further supports Koster's [26] notion of learning: Moments of *learning & improvement* typically consisted of situations where players were figuring out new information, such as enemy patterns or where they were improving on their performance after a string of failures, also coinciding with Juul [18], stating that avatar death is the death you survive and learn from. In total, 95% of all participants who reported moments of *learning & improvement* also reported *difficulties & failures*. It therefore seems that a challenging gameplay, where players are likely to fail, may enable learning processes, which eventually lead to a performance improvement. These findings coincide with Iacovides et al. [15] who showed that breakdowns (caused by challenges) do lead to learning if there was a breakthrough in understanding how to solve the problem in the game. The present study extends our understanding of learning moments in video games by showcasing their accentuated role in a context of high challenges and numerous avatar deaths. In a game, where *difficulties & failures* are frequent, moments of learning are especially important for a positive experience. As seen in player reports, moments of learning to a large extent stem from *difficulties & failure*, further emphasizing the role of high challenges and avatar death as a learning mechanic.

### Achievements & Victories

In line with previous player experience research (e.g. [5]), the second important contributor to positive experiences identified in this study was *achievements & victories*. A closer look at how achievements in *Dark Souls III* are characterized and described sheds some light on their role in a high challenge context: Narrations of *achievements & victories* usually depicted a victorious boss fight or another challenging enemy encounter, typically after a series of failed attempts. Similar to previous work on permadeath in *DayZ* [2, 7], where high risks and consequences increased players' sense of involvement and meaning, players in the present study often rated their achievement as particularly satisfying in view of previous failed attempts and struggles. Player reports of victory and success clearly depict that, much like in *DayZ*, grave consequences resulting from avatar death and high challenges in *Dark Souls III* form a general atmosphere of anxiety, fear of imminent loss and the player's awareness of everything being at stake. This is in line with the general assumption that excessive challenge levels beyond the challenge-skill balance lead to anxiety [11]. However, anxiety itself in this case emphasized the achievement as a hard-earned success amidst unpredictable outcomes and high challenges. This might be an indication that a positive experience and enjoyment are not exclusively tied to optimal challenge-skill balance and flow. It furthermore raises questions about the significance of these concepts and if they are adequate for every type of player experience, since excessive difficulty in the present case was able to form meaningful achievements. Yet, since the game appeals to a rather specific audience, which will be addressed in the Limitations section, it is difficult to draw concrete conclusions concerning this matter based on the results of this study.

Considering players' accounts of successful moments, it comes as little surprise that 95% of all participants who reported *achievements & victories* also reported narrations of difficulties and failure. Furthermore, when looking only at participants who experienced *difficulties & failure*, *achievements & victories* occurred significantly more often in the positive experience group. As a contribution to player experience research, we showcased the interplay of positive and negative experiences, emphasizing that not only are they not mutually exclusive, but one actually to a large extent depends on the other. Applying a different methodological approach than Allison et al. [2], our results confirm that the meaning of achievements is heightened through severe consequences from avatar death. In addition, the present study was able to showcase this finding not only with qualitative reports but analyzed in more detail frequencies of the themes *achievements & victories* in relation to *difficulties & failures*. Achievements themselves therefore may be directly linked to positive emotions [5], but in *Dark Souls III* achievements to a large extent are characterized by avatar death and high challenges. Whereas Bopp et al. [5] demonstrated that intense, negative emotions such as sadness directly contribute to positive player experiences, our results show that negative events such as avatar death and difficulties do not directly predict a positive experience, but they enable and characterize moments of achievement and learning.

### Challenge and Enjoyment

In contrast to studies conducted by Schmierbach et al. [35], Klarkowski et al. [23] and Gutwin et al. [13], which showed lower enjoyment scores for higher difficulties, a higher challenge in the present study was more likely to be associated with a positive experience. Moreover, enjoyment and positive affect ratings, while being significantly lower in the negative experience group, were generally very high even in the negative group, showing that negative experiences did not lead to low enjoyment. This might be due to the players' awareness that high challenges and avatar death are a crucial component for the enjoyment of *Dark Souls III*. Thus, a play session with negative experiences might still be perceived as enjoyable, if players realize that they are in a process of learning and thus perceive failing as part of a bigger experience. Our results indicate that difficult games are not in general less enjoyable as assumed by Schmierbach et al. [35]. Not only did *difficulties & failures* occur as often in positive as in negative experiences, but they for many players enabled and formed *achievements & victories* and moments of *learning & improvement* for positive experiences, thus demonstrating, how close negative and positive events were intertwined in *Dark Souls III*.

In conclusion, the present study emphasizes the role of *achievements & victories* and *learning & improvement* in a highly challenging context in order to reach a positive experience. Achievements themselves are perceived as outstanding experiences in contrast to the state of anxiety and fear the game creates through its excessive challenges and impactful avatar death mechanic. Victories over enemies were enjoyed so much because players had to earn them the hard way. This finding goes in line with Przybylski et al. [32], showing that rewards provide competence need-satisfaction and increase motivation if the game offers a challenging gameplay. Reward may thus have even more value, if the game contains higher challenges. Hard-earned achievements seem to make up for frustrations and negative moments in the game, a role which may be not as emphasized in less challenging games. Although *Dark Souls III* is not a casual game, these implications may also be of interest for a broader market. The implementation of difficult-to-reach goals adds a further challenge and depth to a game, committing players who are willing to devote more time to reach out for more difficult goals. In casual games the achievement of difficult goals may be not as critical for an enjoyable experience but they could nevertheless add an additional layer of depth and appeal for some players. High challenges and punishing avatar death mechanics may not be crucial to all type of games for a positive experience, but they seem to play a substantial role in enabling learning processes, thus making achievements seem hard-earned and meaningful.

### Limitations

To explore why some players enjoy video games with excessive difficulty, we specifically recruited participants with the help of online fan forums of *Dark Souls*. We felt that this was a necessary step, since the game has a very steep learning curve at the beginning and to have novices play the game would have been a completely different (albeit interesting) study. This procedure however most likely led to a very specific sample who might have had a strong positive bias towards this kind of



games. This becomes evident when taking a closer look at the sample of this study: Participants were mainly male players (95.8%) with an average age of less than 24 years. Almost all participants reported experience with other games of this series (e.g. *Dark Souls* or *Dark Souls II*) and therefore might have a strong affinity for challenging games, respectively a tolerance for high difficulty gameplay. The participants of this study also probably knew what to expect from *Dark Souls III* and their skill level to a certain degree most likely matched the high demands of the game, which made it possible to reach a positive experience in the first place. Hence, the results of this study may in some respects be dependent on personal preferences and player personalities and can therefore not be generalized for all types of players. As stated by Yun et al. [44], when discussing game enjoyment it is not sufficient to merely categorize players according to their level of experience in video games, another basic criterion is if a players' primary objective in a game is seeking challenges, victories or a balanced version of both. Although we found moments of *achievements & victories* and *learning & improvement* to be crucial elements of positive experiences, one could argue that these factors are especially important to players specifically seeking challenges (*challenge seekers*), but may not play a predominant role for other player personalities. Juul's notion of players' repertoire [21] applies in this context in two different ways. First, challenge in *Dark Souls III* is based on learning how to control the character and on reading enemy attack and movement patterns, i.e. the player needs to build up a repertoire of skills and strategies throughout the game and adapt and refine them as he or she encounters new enemies. Second, the perception of difficulty is shaped by the players' experience with previous games that they have played and the skills and strategies they have acquired. Since most participants of this study were already experienced with the *Dark Souls* series, they most likely built up a repertoire of skills and strategies that helped them to reach the game's goals, thus influencing the perception of the difficulty in *Dark Souls III* and possibly other games as well. It would therefore be up to future research to explore in detail, how different player personalities with different skill repertoires influence the meaning of *achievements & victories* and *learning & improvement* in video games.

The results may also not be generalized for all game genres and designs, since this study merely discusses one specific type of game. The action oriented gameplay of *Dark Souls III* focuses heavily on real-time melee combat and therefore offers a very specific type of challenge. The game does not cover all aspects of gameplay difficulty and even within the RPG-genre a game can be challenging because of various reasons, such as hard to solve puzzles or complex turn-based combat systems. However, *Dark Souls III* still features many common sources of difficulty such as learning different enemy patterns, developing new strategies, character control, reaction speed and luck.

The present exploratory study identified *achievements & victories* and *learning & improvement* as predominant factors associated with positive experiences in a setting of high challenges. No conclusions can be made concerning the causal

effect of high-challenge settings on positive experiences if, for example, compared to low-challenge settings. It would be up to future work, to compare different game difficulty levels with regard to achievement and learning experiences. Still, the present study identified some important predictors for positive experiences and their relationship to negative events, which should be taken into account, when discussing the role of challenge and avatar death in any video game.

Furthermore, participants in the present study were asked to report an outstanding experience from their memory and may have missed out or altered important information, which in hindsight were perceived differently. For instance, the perceived challenge-skill balance is associated with a positive experience, which coincides with Klarkowski et al. [23], demonstrating higher enjoyment scores for balanced experiences. Considering the numerous occurrences of *difficulties & failures* across all experiences in our study, it is unclear though, how strong the perceived challenge-skill balance in the end may be influenced by recent achievements in the game. Gutwin et al. [13] demonstrated an effect on players' perception focusing on peaks and ends of the game. It is therefore a reasonable assumption that a play session in hindsight may seem more balanced after a glorious victory than it actually was, thus relativizing the role of challenge-skill balance as it is currently discussed in research (e.g. [13, 23]). As the comparison of negative events and high enjoyment ratings showed, qualitative and quantitative measures may highlight different aspects of an experience and therefore a combination of both allows for a more nuanced discussion. Future research applying subjective and behavioral measures may provide further insights concerning actual events in the game and how they were perceived by players.

## Conclusion

An appropriate challenge-skill balance is usually seen as being substantial for positive player experiences. However, the present study found that negative events such as *difficulties & failures* characterize moments of *achievements & victories* and *learning & improvement*. These moments to a large extent explain positive player experiences in a game with excessive difficulty. Players' reports indicate that high challenges and avatar death make moments of achievement meaningful and thus, enable positive player experiences.

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## REFERENCES

1. Justin T. Alexander, John Sear, and Andreas Oikonomou. 2013. An investigation of the effects of game difficulty on player enjoyment. *Entertainment Computing* 4, 1 (2013), 53–62. <http://www.sciencedirect.com/science/article/pii/S1875952112000134>
2. Fraser Allison, Marcus Carter, and Martin Gibbs. 2015. Good Frustrations: The Paradoxical Pleasure of Fearing

- Death in DayZ. In *Proceedings of the Annual Meeting of the Australian Special Interest Group for Computer Human Interaction*. ACM, 119–123.  
<http://dl.acm.org/citation.cfm?id=2838810>
3. Maria-Virginia Aponte, Guillaume Levieux, and Stéphane Natkin. 2011. Difficulty in videogames: an experimental validation of a formal definition. In *Proceedings of the 8th International Conference on Advances in Computer Entertainment Technology*. ACM, 49. <http://dl.acm.org/citation.cfm?id=2071484>
  4. Scott Bateman, Regan L. Mandryk, Tadeusz Stach, and Carl Gutwin. 2011. Target assistance for subtly balancing competitive play. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, 2355–2364.  
<http://dl.acm.org/citation.cfm?id=1979287>
  5. Julia Ayumi Bopp, Elisa D. Mekler, and Klaus Opwis. 2016. Negative Emotion, Positive Experience? Emotionally Moving Moments in Digital Games. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, 2996–3006.  
<http://dl.acm.org/citation.cfm?id=2858227>
  6. Virginia Braun and Victoria Clarke. 2006. Using thematic analysis in psychology. *Qualitative research in psychology* 3, 2 (2006), 77–101. <http://www.tandfonline.com/doi/abs/10.1191/1478088706qp0630a>
  7. Marcus Carter, Martin Gibbs, and Greg Wadley. 2013. Death and dying in DayZ. In *Proceedings of The 9th Australasian Conference on Interactive Entertainment: Matters of Life and Death*. ACM, 22.  
<http://dl.acm.org/citation.cfm?id=2513013>
  8. Jared E. Cechanowicz, Carl Gutwin, Scott Bateman, Regan Mandryk, and Ian Stavness. 2014. Improving player balancing in racing games. In *Proceedings of the first ACM SIGCHI annual symposium on Computer-human interaction in play*. ACM, 47–56.  
<http://dl.acm.org/citation.cfm?id=2658701>
  9. Jenova Chen. 2007. Flow in games (and everything else). *Commun. ACM* 50, 4 (2007), 31–34.  
<http://dl.acm.org/citation.cfm?id=1232769>
  10. Amra Copcic, Sophie McKenzie, and Michael Hobbs. 2013. Permadeath: A review of literature. In *2013 IEEE International Games Innovation Conference (IGIC)*. IEEE, 40–47. [http://ieeexplore.ieee.org/xpls/abs\\_all.jsp?arnumber=6659156](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=6659156)
  11. M. Csikszentmihalyi. 1990. *Flow. The Psychology of Optimal Experience*. New York: Harper Perennial.
  12. Emily Flynn-Jones. 2015. Don't Forget to Die: A Software Update is Available for the Death Drive. In *The Dark Side of Game Play: Controversial Issues in Playful Environments*, T. Mortensen, J. Linderorth, and A. Brown (Eds.). London: Routledge, 50–66.
  13. Carl Gutwin, Christianne Rooke, Andy Cockburn, Regan L. Mandryk, and Benjamin Lafreniere. 2016. Peak-End Effects on Player Experience in Casual Games. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, 5608–5619.  
<http://dl.acm.org/citation.cfm?id=2858419>
  14. Robin Hunicke. 2005. The case for dynamic difficulty adjustment in games. In *Proceedings of the 2005 ACM SIGCHI International Conference on Advances in computer entertainment technology*. ACM, 429–433.  
<http://dl.acm.org/citation.cfm?id=1178573>
  15. Ioanna Iacovides, Anna L. Cox, Patrick McAndrew, James Aczel, and Eileen Scanlon. 2015. Game-play breakdowns and breakthroughs: exploring the relationship between action, understanding, and involvement. *Human-computer interaction* 30, 3-4 (2015), 202–231. <http://www.tandfonline.com/doi/abs/10.1080/07370024.2014.987347>
  16. Wijnand IJsselstein, Wouter Van Den Hoogen, Christoph Klimmt, Yvonne De Kort, Craig Lindley, Klaus Mathiak, Karolien Poels, Niklas Ravaja, Marko Turpeinen, and Peter Vorderer. 2008. Measuring the experience of digital game enjoyment. In *Proceedings of Measuring Behavior*. Noldus Information Technology Wageningen, Netherlands, 88–89.
  17. Seung-A. Annie Jin. 2012. Toward integrative models of flow: Effects of performance, skill, challenge, playfulness, and presence on flow in video games. *Journal of Broadcasting & Electronic Media* 56, 2 (2012), 169–186. <http://www.tandfonline.com/doi/abs/10.1080/08838151.2012.678516>
  18. Jesper Juul. 1999. *A clash between game and narrative*. Master's thesis. University of Copenhagen.  
<http://www.jesperjuul.net/thesis/AClashBetweenGameAndNarrative.pdf>
  19. Jesper Juul. 2009. Fear of failing? The many meanings of difficulty in video games. In *The Video Game Theory Reader*, Mark J. P. Wolf and Bernard Perron (Eds.), Vol. 2. New York: Routledge, 237–252.
  20. Jesper Juul. 2010. *A casual revolution: Reinventing video games and their players*. Cambridge, Mass: MIT Press.
  21. Jesper Juul. 2011. *Half-real: Video games between real rules and fictional worlds*. Cambridge, Mass: MIT Press.
  22. Jesper Juul. 2013. *The art of failure: An essay on the pain of playing video games*. Cambridge, Mass: MIT Press.
  23. Madison Klarkowski, Daniel Johnson, Peta Wyeth, Mitchell McEwan, Cody Phillips, and Simon Smith. 2016. Operationalising and Evaluating Sub-Optimal and Optimal Play Experiences through Challenge-Skill Manipulation. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, 5583–5594.  
<http://dl.acm.org/citation.cfm?id=2858563>

24. Lisbeth Klastrup. 2007. Telling & sharing? Understanding mobile stories & future of narratives. In *7th international digital arts and culture conference the future of digital media culture*. Perth, Australia. [http://www.leonardo.info/LEA/perthDAC/LKlastrup\\_LEA160203.pdf](http://www.leonardo.info/LEA/perthDAC/LKlastrup_LEA160203.pdf)
25. Christoph Klimmt, Christopher Blake, Dorothée Hefner, Peter Vorderer, and Christian Roth. 2009. Player performance, satisfaction, and video game enjoyment. In *International Conference on Entertainment Computing*. Springer, 1–12. [http://link.springer.com/chapter/10.1007/978-3-642-04052-8\\_1](http://link.springer.com/chapter/10.1007/978-3-642-04052-8_1)
26. Raph Koster. 2013. *Theory of fun for game design*. Sebastopol, CA: O'Reilly Media.
27. Nicole Lazzaro. 2004. Why we play games: Four keys to more emotion without story. Presentation at the Game Developers Conference. [http://www.xeodesign.com/whyweplaygames/xeodesign\\_whyweplaygames.pdf](http://www.xeodesign.com/whyweplaygames/xeodesign_whyweplaygames.pdf). (2004). Accessed: 2016-09-19.
28. Mary Beth Oliver and Anne Bartsch. 2010. Appreciation as Audience Response: Exploring Entertainment Gratifications Beyond Hedonism. *Human Communication Research* 36, 1 (Jan. 2010), 53–81. DOI: <http://dx.doi.org/10.1111/j.1468-2958.2009.01368.x>
29. Wei Peng, Jih-Hsuan Lin, Karin A. Pfeiffer, and Brian Winn. 2012. Need satisfaction supportive game features as motivational determinants: An experimental study of a self-determination theory guided exergame. *Media Psychology* 15, 2 (2012), 175–196. <http://www.tandfonline.com/doi/abs/10.1080/15213269.2012.673850>
30. Felipe Pepe. 2016. The history of the Quest Compass & its dreadful convenience. [http://www.gamasutra.com/blogs/FelipePepe/20160412/270100/The\\_history\\_of\\_the\\_Quest\\_Compass\\_its\\_dreadful\\_convenience.php](http://www.gamasutra.com/blogs/FelipePepe/20160412/270100/The_history_of_the_Quest_Compass_its_dreadful_convenience.php). (April 2016). Accessed: 2016-09-21.
31. Helmut Prendinger, Kamthorn Puntumapon, and Marconi Madruga. 2016. Extending Real-Time Challenge Balancing to Multiplayer Games: A Study on Eco-Driving. *IEEE Transactions on Computational Intelligence and AI in Games* 8, 1 (2016), 27–32. [http://ieeexplore.ieee.org/xpls/abs\\_all.jsp?arnumber=6932459](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=6932459)
32. Andrew K. Przybylski, C. Scott Rigby, and Richard M. Ryan. 2010. A motivational model of video game engagement. *Review of general psychology* 14, 2 (2010), 154. <http://psynet.apa.org/journals/gpr/14/2/154/>
33. Ute Ritterfeld, Michael Cody, and Peter Vorderer. 2009. *Serious games: Mechanisms and effects*. New York: Routledge.
34. Richard M. Ryan, C. Scott Rigby, and Andrew Przybylski. 2006. The motivational pull of video games: A self-determination theory approach. *Motivation and emotion* 30, 4 (2006), 344–360. <http://link.springer.com/article/10.1007/s11031-006-9051-8>
35. Mike Schmierbach, Mun-Young Chung, Mu Wu, and Keunyeong Kim. 2014. No One Likes to Lose. *Journal of Media Psychology* 26, 3 (2014), 105–110. <http://dx.doi.org/10.1027/1864-1105/a000120>
36. John L. Sherry. 2004. Flow and media enjoyment. *Communication theory* 14, 4 (2004), 328–347. <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-2885.2004.tb00318.x/abstract>
37. Jan D. Smeddinck, Regan L. Mandryk, Max V. Birk, Kathrin M. Gerling, Dietrich Barsilowski, and Rainer Malaka. 2016. How to Present Game Difficulty Choices? Exploring the Impact on Player Experience. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*. ACM, New York, NY, USA, 5595–5607. <http://doi.acm.org/10.1145/2858036.2858574>
38. Penelope Sweetser and Peta Wyeth. 2005. GameFlow: a model for evaluating player enjoyment in games. *Computers in Entertainment (CIE)* 3, 3 (2005), 3–3. <http://dl.acm.org/citation.cfm?id=1077253>
39. Chin Hiong Tan, Kay Chen Tan, and Arthur Tay. 2011. Dynamic game difficulty scaling using adaptive behavior-based AI. *IEEE Transactions on Computational Intelligence and AI in Games* 3, 4 (2011), 289–301. [http://ieeexplore.ieee.org/xpls/abs\\_all.jsp?arnumber=5783334](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5783334)
40. Edmund R. Thompson. 2007. Development and validation of an internationally reliable short-form of the positive and negative affect schedule (PANAS). *Journal of cross-cultural psychology* 38, 2 (2007), 227–242. <http://jcc.sagepub.com/content/38/2/227.short>
41. Rodrigo Vicencio-Moreira, Regan L. Mandryk, and Carl Gutwin. 2015. Now you can compete with anyone: Balancing players of different skill levels in a first-person shooter game. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. ACM, 2255–2264. <http://dl.acm.org/citation.cfm?id=2702242>
42. Peter Vorderer, Christoph Klimmt, and Ute Ritterfeld. 2004. Enjoyment: At the heart of media entertainment. *Communication theory* 14, 4 (2004), 388–408. <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-2885.2004.tb00321.x/abstract>
43. Douglas Wilson and Miguel Sicart. 2010. Now it's personal: on abusive game design. In *Proceedings of the International Academic Conference on the Future of Game Design and Technology*. ACM, 40–47. <http://dl.acm.org/citation.cfm?id=1920785>
44. Chang Yun, Philip Trevino, William Holtkamp, and Zhigang Deng. 2010. PADS: enhancing gaming experience using profile-based adaptive difficulty system. In *Proceedings of the 5th ACM SIGGRAPH Symposium on Video Games*. ACM, 31–36. <http://dl.acm.org/citation.cfm?id=1836140>