

Beware of the Angry Stingers - A First-person Action Game Set in an Exaggerated Commonplace Scenario

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Figure 1: A wasp in front of the garden.

ABSTRACT

First-person games are typically set in scenarios distant to the player, such as war or science fiction, as this works particularly well to create a virtual-physical threat, that is central to the gaming experience. In order to stand out from this oversupply, we aim to instead achieve this by exaggerating an everyday situation in a caricatured manner. This paper presents a game, which explores this idea by being set in a barbecue, that is invaded by wasps. It is a first-person *action game* with *arcade*, *casual game* and *beat 'em up* elements. Through a study that collects quantitative and qualitative data on the gaming experience, we demonstrate the potential of that approach.

KEYWORDS

video game, action game, first-person, beat 'em up, brawler, arcade, casual game

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1 INTRODUCTION

The majority of games seemingly are designed to put the player into spectacular scenarios far removed from everyday life. Especially first-person shooters such as *Counter Strike* or *Battlefield* are commonly set in war scenarios. It is supposed that the resulting virtual-physical threat situations put the player under stress, which in turn evokes the feeling of fun [2].

In this paper, we present a game that aims to recreate the core of that concept in a more relatable and less controversial everyday scenario. To achieve that, the ordinary situation of a summer night barbecue being disturbed by wasps is explored: In the game, the player has the task of eliminating wasps using a fly swatter and an insect spray. In order to generate a convincing virtual-physical

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threat situation, the insects are oversized and show particularly aggressive behavior while invading the property of the player character. Thus, we named the game "Angry Stingers".

In the following, we discuss games based on similar principles as ours, before we address the design of the game, including its world, mechanics, game art and menus. As for testing the game, we conducted short playtesting sessions while using the *Game Experience Questionnaire* [10], participants' qualitative feedback and the in-game logs for evaluation.

2 RELATED WORK

In this section, we discuss games that are similar to ours, how they impact *Angry Stingers* and the methods we can utilize to evaluate this game.

Angry Stingers draws inspiration from a number of different genres. It contains arcade elements similar to such titles as *Galaga*. In *Galaga*, the player focuses on defeating enemy aliens that are akin to insects. The enemies dive towards the player and try to hurt him, whereas the player tries to avoid them and in turn shoots the aliens to gain points [5]. Although *Galaga* is set in a 2D environment, the main gameplay loop is similar to our game, since it too includes a player character that tries to avoid enemies in a stressful situation and defeating them increases your high score. Also, both games only end after the health of the player reaches zero.

Besides the arcade elements, our game was also influenced by 3D first-person games such as *The Super Spy*, which is a *beat 'em up* game from 1990 in which the player could move around freely while defeating enemies [17]. First-person games are as popular as ever, especially when it comes to first-person shooters such as *DOOM*, which currently spans releases from 1995 [7] to 2020 [6]. These games can be tense and stressful, since the player has to be cautious and can't see directly, what is behind his avatar. This leads to an always remaining level of uncertainty. By using a first-person perspective ourselves, we expect to invoke the same feelings in our game.

At the same time, the stress level should stay within limits, since our game also provides a more casual experience similar to casual or mobile games. Our game is expected to last around five minutes, so the player is not expected to feel tense for a long period of time. The casual approach also leads to a modest level of challenge. Since we expect the player to be on edge because of the virtual-physical threat situation, we do not want the game to be too hard in order to not overwhelm the player, since the situation itself is already potentially challenging.

3 GAME DESIGN

Angry Stingers is an *action* game, which cannot be clearly assigned to a subgenre, since it contains elements of various subgenres. The game mostly follows a casual arcade style of gameplay in first-person, which focuses on surviving long enough in a 3D environment to increase the score by defeating enemies, represented in this game as wasps. With the first-person perspective and the focus on weapon-based combat, the game also features key elements of a first-person shooter. The goal of the game is to swat as many wasps as possible before the health of the player reaches zero in order to beat the previous highscore.

We used *Blender* [3] to model the environment and the *Unity 3D* [20] game engine to implement the game.

3.1 The game world

The game takes place inside and outside a house, where an evening barbecue is being held. The outer appearance and design concept of the house is based on the family's home from *The Simpsons* [9] sitcom, as it represents an ordinary standard-shaped building common in many neighborhoods.

The game's story is as follows: The barbecue attracts the attention of hungry wasps that, who try to scare the player character off by chasing and stinging him. The protagonists, in turn, tries to defend himself by using a fly swatter and an insect spray to eliminate any wasps that invade the premises. He can relieve his pain by gathering onions, which are known as household remedies for alleviating the pain from stings [8].

The main level of the game is divided into two main areas: the inside of the house (which consists of a first floor with a living room, a bathroom as well as a garage and a second floor with the extended living room as well as a bedroom) and the outside of the house (which includes a terrace, a garage driveway as well as a garden). The player can move freely in these areas by using the mouse to control the camera and the WASD keys to go forwards, backwards, sideways and diagonal respectively. This enables the player to explore their surroundings and to move to a different location. Most objects can also be moved by walking into them or by slamming wasps into them, so the player is more inclined to move around and see with which objects they can interact with and what the behavior of these objects is. The reason to include this feature was to make the player notice, that his actions have impact on the surroundings. This is also intended to provide an entertaining effect of the 3D world becoming more chaotic the longer the run lasts, which is complemented by the presence of already defeated bees that remain unconscious on the ground during the run. Additionally, we expect this to prevent the player from only standing at the spawn point and not interacting with the world itself.

3.2 Combat mechanics

The protagonist is constantly confronted with wasps that come after him throughout the game. To fight them back it is equipped with a fly swatter in his right hand and occasionally with a can of insect spray in his left hand. In a manner that is actually typical for first person shooters [16], the player is embodied, by arms holding those items, the controllable camera, a HUD and visual hit feedback in the form of a flashing red screen. These weapons can be used by either pressing the left or right mouse button, depending on the setting in the options menu. The default control scheme is pressing the left mouse button to use the swatter and pressing the right mouse button to use the spray, while the alternative control scheme is pressing the left mouse button to use the spray and pressing the right mouse button to use the swatter.

The fly swatter can be used to hit the wasps at close range. Further swatter attacks are only possible again when the attack move has finished, and the swatter is back in its original position. This way the player is required to time his strokes carefully instead of constantly clicking the mouse button. If the swatter hits a wasp,

it either loses health and is pushed back or, if it has no health points left, it dies and falls to the ground. It is also possible to use the swatter while moving around to close the distance and to not limit the movement of the player.

To prevent the wasps from being overwhelming, the player can collect a can of insect spray, that shoots out mist in the direction the player is pointing as long as the corresponding mouse button is pressed and as long as the meter is not depleted. The spray slows down any wasp being hit by it. After it is depleted, the player needs to find another spray can to use it again. Similar to the fly swatter you can also use the spray while moving around.

3.3 Power-ups

In order to make the player experience moments of reward we included power-ups. *Angry Stingers* has two different power-ups: An onion and a spray can, that represents ammo for the insect spray.

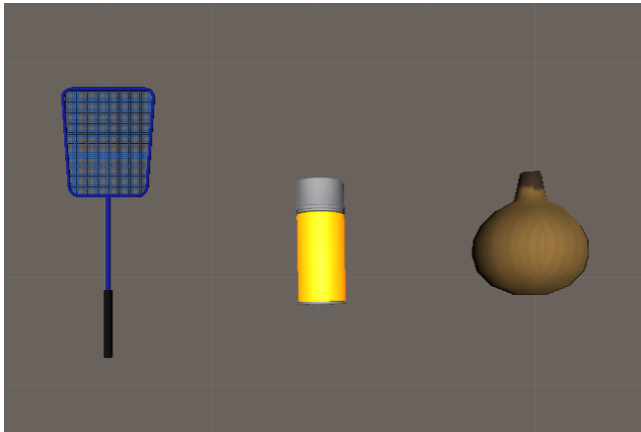


Figure 2: The key game objects fly swatter, spray and onion

The spray can increases the offensive capabilities of the player and encourages them to be more strategic during combat. It can be used to either defeat the wasps faster and play more aggressively or to slow some wasps down while dealing with other ones. It has a meter that depletes with the particles emitted.

The onion on the other hand increases the defensive capabilities of the player by giving him an extra hit point. This is based on the traditional practice of treating wasp stings with onions [8]. Depending on the play style, it can also lead to the player being more aggressive when they have the maximum amount or almost the maximum amount of hit points, since they can get their health back immediately. At the same time, low health can lead to the player being more cautious until another onion spawns, so the power-up has a different effect on the player depending on the remaining health and how they approach the game.

Each power-up type has an individual spawn routine, that makes that power-up respawn 25 to 35 seconds after it has been collected. The location of the power-up is randomly selected from a list of locations we regarded as appropriate for the respective power-up type.

3.4 Game art

Angry Stingers is presented in a cartoonal art style with bright colors, less detailing and less realistically proportioned objects. As described by Manning [14], we adopted the principle of "Amplification Through Simplification" to put the player's focus on the game objectives. Since the game story itself is of a caricatured nature, we aimed for a visual style in line with a fun looking game, that does not take itself too seriously.



Figure 3: A wasp as appearing in the game

This style was also chosen, because the subject matter of hitting and killing wasps should not be taken too seriously and distract the player. Choosing a very cartoonal and disproportioned wasp was important to avoid both, creating a horror game like experience and evoke feeling of guilt about killing them, since they are clearly fake wasps that only appear in the game. The wasp's 3d model, texture and animations were imported from the unity package "Fantasy Bee". [1].

Most of the useful or relevant objects in the game are also larger than in reality. This decision was made to enhance their visibility to the player. Power-ups need to stand out from the ordinary obstacle objects in order to make their special characteristics obvious to the player. The size plays an important role for the wasps as well, as the player needs to hit them to gain points and realistically sized wasps are harder to see and harder to hit. Due the circumstance of using a cartoonal style this size distortion is not significantly detrimental to the immersion, as the game establishes its own set of visual rules and the style of the game is consistent across all objects [14].

The music score was selected from the online repositories of royalty-free music *Free Music Archive* [18] and *dig.ccMixer* [15]. We chose a subtle bluesy guitar instrumental [13] as menu theme, as we considered it suitable for the peaceful starting point of a summer barbecue. The in-game music consists of an up-tempo track, which builds on a techno beat in line with the pace and the threat represented [19]. The track is also dominated by guitars, which is supposed to bridge the gap to the menu starting point.

3.5 Menu and options

Upon starting the game, the player is presented with the main menu. From this menu, they can access the main game, a tutorial section,

the options menu and they are able to close the game after they finished playing.

Out of these options, the option menu gives the player the freedom to change certain aspects of the game. These include changing the volume, the language and the control scheme. Players are able to change the volume in case that the bee sounds, or the music are too loud and therefore distracting. It is also possible to mute the audio completely, but this is not recommended, since locating the wasps by their buzzing is part of the game and muting the audio might lead to not noticing wasps that spawn directly behind the player avatar.

The option to change the language from english to german was included, since the game was originally developed for a german speaking audience. To make the game more accessible for a broader number of players english was chosen as the default language.

The third available option for the player is to switch between two control schemes for the mouse, the default scheme (use swatter with left click and spray with right click) and the alternative scheme (use swatter with right click and spray with left click). These control options were chosen, since it might be uncomfortable for some players to use the swatter which is on the right side of the screen in-game, but to use it you have to press the left mouse button and vice versa for the spray. Pressing the left mouse button to use the swatter was chosen as the default control scheme, since the left mouse button is also the default button for confirming on a PC and it used more frequently compared to the right mouse button, which in this game is only available after the player collects the spray can power-up and the right mouse button is therefore used less frequently.

3.6 Tutorial

Also available via the main menu is a tutorial, which can assist in case of questions. The tutorial section in the game aims to not deter the player by forcing him to read a manual. He can start the game immediately after he finishes the tutorial. This menu mainly explains the controls, the functions of the power-ups, the goal of the game and what the player should avoid to not lose.

3.7 In-game User Interface

In the game itself, the player is presented two HUD elements: One on the left displaying the amount of wasp he defeated and one on the right reporting the health status. Both are displayed in large size to enable the player to see the information without difficulties. The HUD elements contain icons, so that the player can easily identify which information is given by which element. The number of defeated wasps is represented by the picture of a wasp, while the amount of health the player has left is represented by an onion.

While playing the game, the player has the ability to pause it whenever he wants by pressing the escape key. This also starts the pause menu, from which players can resume the game or return to the main menu, if he wants to stop playing or needs to change some options. Pausing the game also freezes all game objects, allowing take a break from playing if he wants to and return to the action anytime.

After the player loses his last remaining life, a game over menu shows him how well he performed in his current playthrough and

how this compares to the high score. This high score system was implemented to encourage a replay. Additionally, it has the purpose of incentivizing the player to try out different strategies and find out which one works the best. This further increases the time spent playing the game. In case a player wants continue the game to try out these new strategies as soon as possible, he can restart the game right from the game over menu. Besides, he is able to return to the main menu and close the game when he feels like he has played enough.

4 EVALUATION

As a playtest for the game we conducted a user study in a single session per participant. Due to the restrictions of the COVID-19 pandemic we were limited to a distribution and execution solely via the internet and to a reduced number of participants.

4.1 Method

As a questionnaire for measuring the playtests we used the *Game Experience Questionnaire (GEQ)* [10]. The questionnaire is divided into 3 modules: the core module, social presence module and post-game module. As the social presence module focuses on multiplayer aspects of a game which do not exist in our game, we omitted this module. Each of the questions of the GEQ uses a 5-point likert scale ranging from *not at all* to *extremely*. We used Google Forms [11] as platform for completing the questionnaire. The questionnaire consisted of 4 pages. On the first page participants were asked for their age and gender, while on the second the questions from the core module of the GEQ could be found. The remaining two pages displayed the post-game module and a further comments section for qualitative feedback on the final page, next to an upload functionality for the game log files.

Initially, participants had to download the zipped game files using a provided link leading to a shared Google Drive [12] folder. The game folder consisted of the built game, an optional instructions document on how to play the game and an internet shortcut file pointing to the questionnaire. Participants were instructed to start the game using an executable file. Once the game was started, they should set the language of the game to their preference. After working through the in-game tutorial slideshow or the previous mentioned instructions document, they should play the game for about 5 minutes for being able to get accustomed to it. After this first round of playtime, the game was closed and the first two pages of the questionnaire consisting of demographic data acquisition like age and gender and the core module questions of the GEQ were answered. Following another 5 minutes of playtime the remaining questions should be answered and qualitative feedback given. Log files stored in the main directory of the game should be attached to the survey by uploading them.

4.2 Participants

We recruited 13 volunteers (4 female, 9 male) with the mean age of 33.31 years and a standard deviation of 12.31 ranging from the age of 20 to 64. Due to previous mentioned limitations we had only few requirements for participants. They were required to have access and being able to operate a computer and follow our written instructions, or with the help of our remote support. We defined

Microsoft Windows [4] as the mandatory operating system as it is the most widespread. As for navigating through the world smoothly a computer mouse was required.

4.3 Results

Analyzing the results of the Game Experience Questionnaire's core module as depicted in figure 5, the overall affect of the game is rather positive. The median of the *Positive Affect* lies at 3.5 (1 = *not at all* to 5 = *extremely*) with little to no variance, while the *Negative Affect* is at about 1.8. Most participants did not rate their in-game performance as very competent. The most differences of opinion could be found in questions regarding the topic of game *Flow*. Overall, they felt rather immersed and challenged in the game than tense or annoyed.

After closing the game, participants felt still rather positive than negative about their made experiences as visualized in figure 6. However, the gap between the negative and positive experiences has narrowed. Neither *Returning to Reality* nor increased *Tiredness* was problem post game.

Besides the questionnaire, we analyzed the log files from the game. Figure 4 implies that players get more accustomed to the game over time. As the game continued, they acted more confident at running around and collecting power-ups. Simultaneously their efficiency in killing wasps increased steadily. Players were supposedly too cautious to run around and looking for spray cans or onions since the median of collected items was zero, as table 1 depicts.

Parameter	Min	Max	Median	Mean	SD
Game Length	22	268	58	96.08	80.42
Wasps Killed	0	39	5	7.77	8.68
Sprays Collected	0	5	0	0.42	0.90
Onions Collected	0	5	0	0.48	0.99

Table 1: Evaluated game log data.

In their qualitative feedback the participants especially appreciated the design of the 3d models, the music and the responsiveness of the objects and environment. The only complaint that was raised by several was the incorrect placement of UI elements in the tutorial. This was due to the fact that the respective participants had a different resolution than *Full HD* (1080p). The bug was fixed in a later version.

5 CONCLUSION

In the scope of this paper, we implemented a 3d *action game*, that combines elements of the genres *first-person shooter*, *beat 'em up*, *brawler* and *casual game*. We aimed to transfer the effect of virtual-physical danger, as seen in typical first-person shooters, into a less controversial, almost everyday setting. Thus, the game features wasps as enemies, fly swatter and insect spray as weapons and takes place in a common house and its garden. To evaluate the game, we conducted playtesting sessions, accompanied by a Game Experience Questionnaire, logs of game events and qualitative feedback. The results suggest, that the game is received slightly more positively

than negatively and more immersing and challenging than tensing and annoying. It also became apparent that the game tended to be too hard for the duration of 10 minutes. The qualitative data indicated, that the game design was well received. However, the log files revealed, that players weren't using the power-ups to the extent that we had intended. Further work on the game could address this by refined game balancing. Furthermore, it should be examined, whether allowing the wasps to enter the house through the windows, would have an impact on this, as we suspect it to encourage the players to move around more. It should still be noted that the conclusive power of the evaluation is limited due to the small number of participants.

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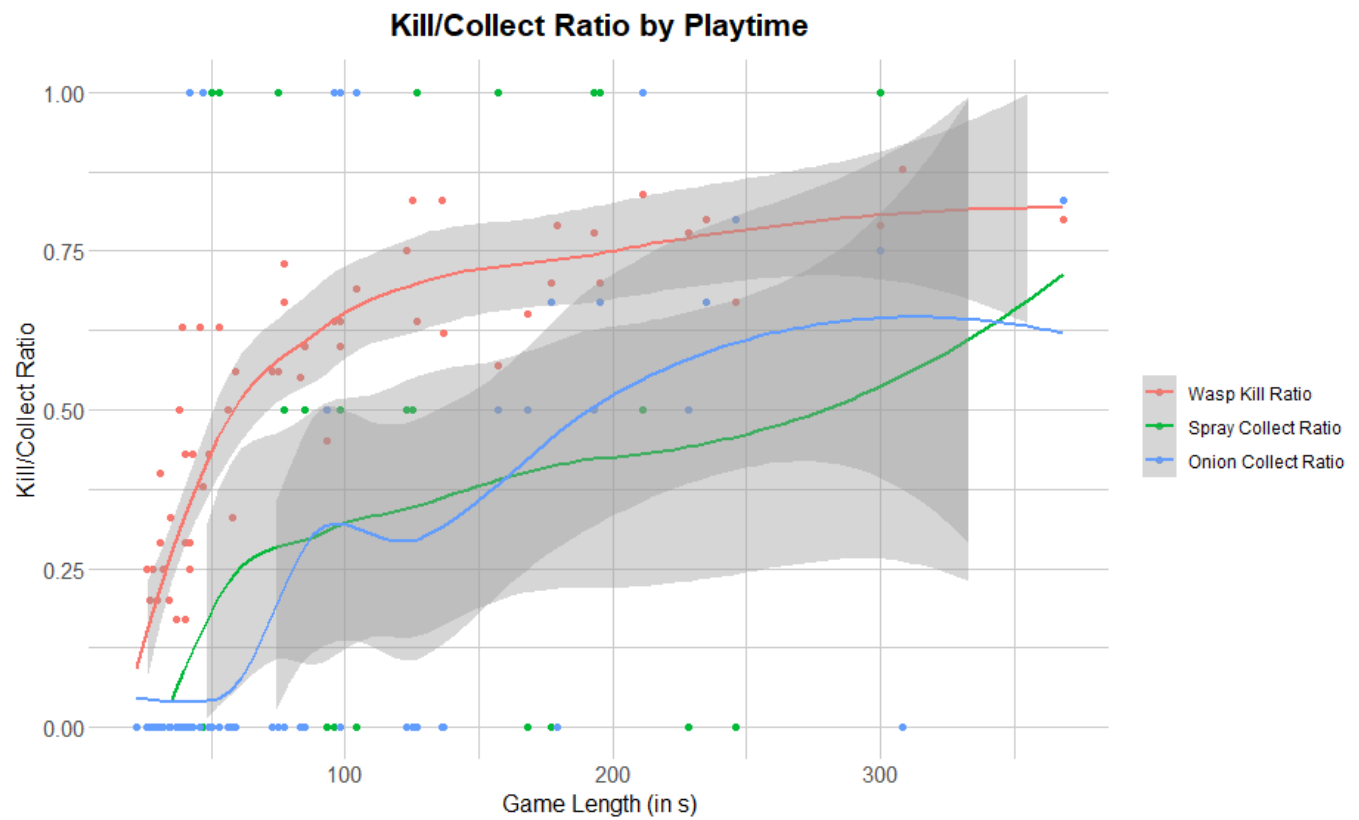


Figure 4: Showing the kill per spawn ratio of wasps respectively the collect per spawn ratio of spray cans and onions over time.

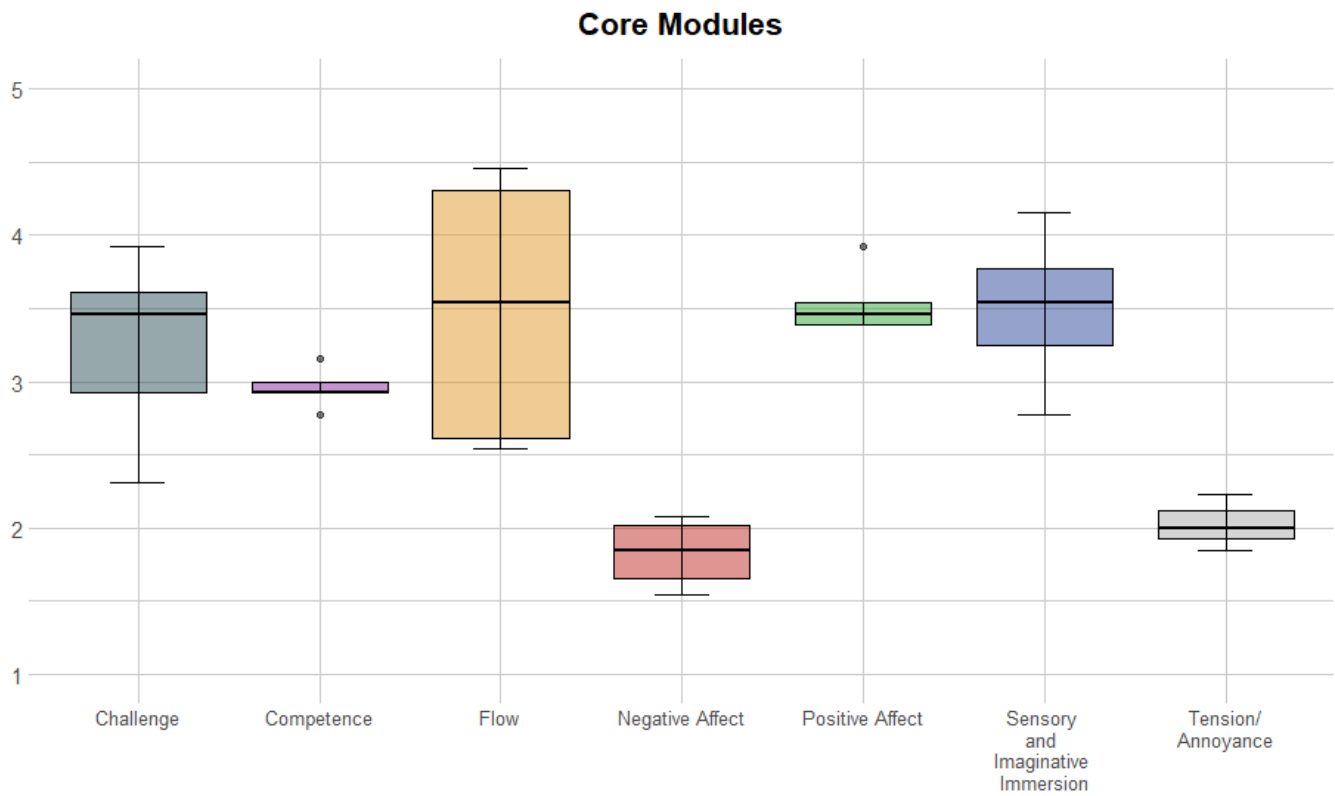
A APPENDIX

Figure 5: Displaying the mean values of all answers given per category for the core module questions of the GEQ.

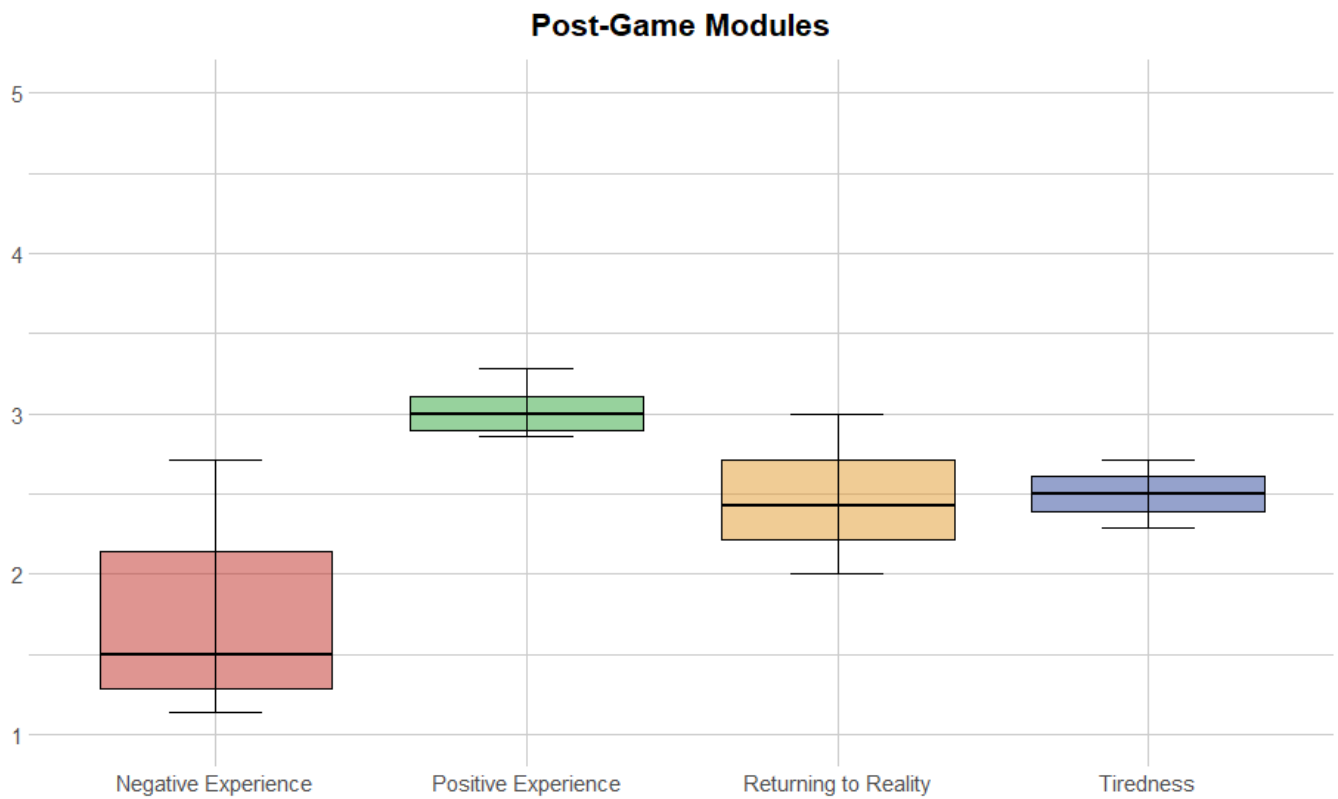


Figure 6: Displaying the mean values of all answers given per category for the post-game module questions of the GEQ.

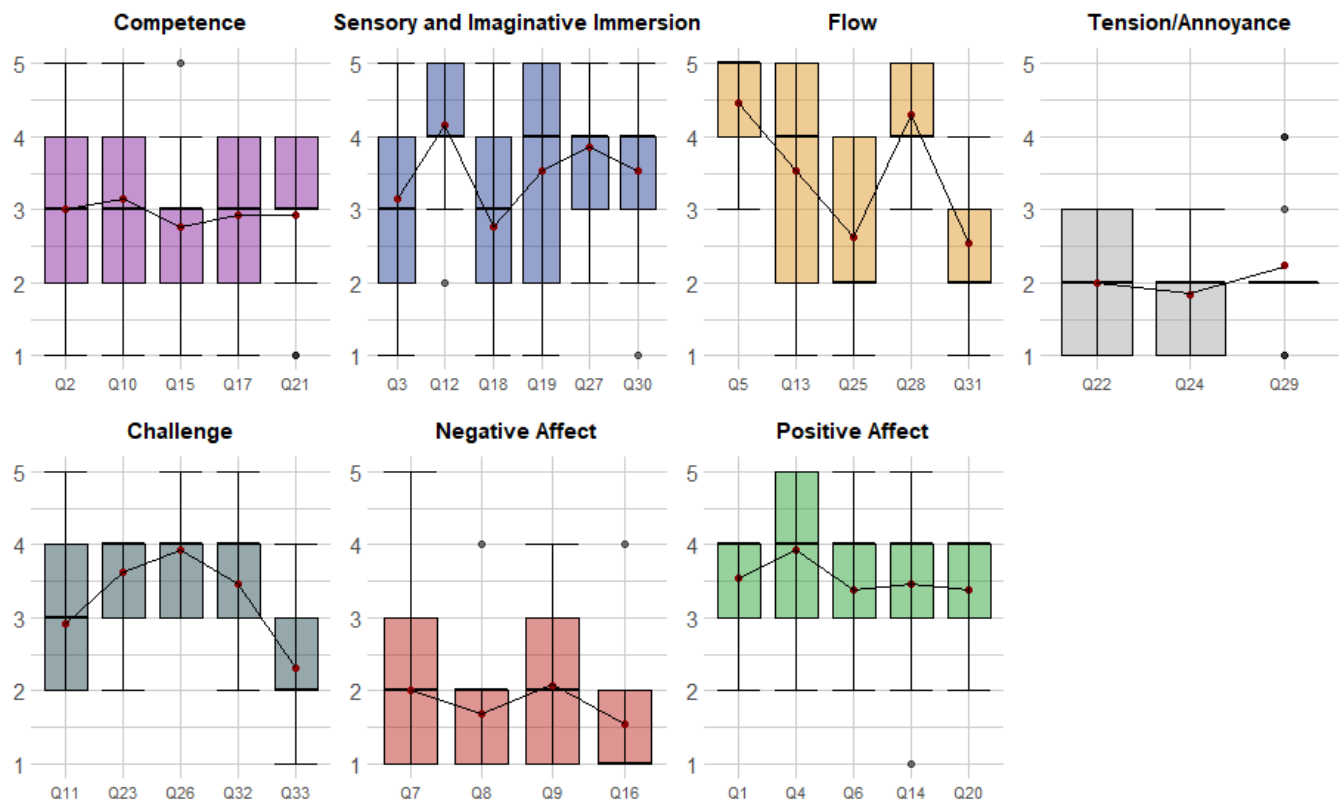


Figure 7: Showing questionnaire answer values for all categories of the GEQ's core module with arithmetic mean (red dots and lines).



Figure 8: Showing questionnaire answer values for all categories of the GEQ's post-game module with arithmetic mean (red dots and lines).

Table 2: Game Experience Questionnaire - Core Module
In addition the values mean and standard deviation attached

ID	Question	Type	Answers
1	I felt content	Positive affect	3.54 \pm 0.63
2	I felt skilful	Competence	3.00 \pm 1.04
3	I was interested in the game's story	Sensory and Imaginative Immersion	3.15 \pm 1.23
4	I thought it was fun	Positive affect	3.92 \pm 0.92
5	I was fully occupied with the game	Flow	4.46 \pm 0.63
6	I felt happy	Positive affect	3.38 \pm 0.92
7	It gave me a bad mood	Negative affect	2.00 \pm 1.18
8	I thought about other things	Negative affect	1.69 \pm 0.82
9	I found it tiresome	Negative affect	2.08 \pm 0.92
10	I felt competent	Competence	3.15 \pm 1.10
11	I thought it was hard	Challenge	2.92 \pm 1.00
12	It was aesthetically pleasing	Sensory and Imaginative Immersion	4.15 \pm 0.95
13	I forgot everything around me	Flow	3.54 \pm 1.34
14	I felt good	Positive affect	3.46 \pm 1.15
15	I was good at it	Competence	2.77 \pm 1.05
16	I felt bored	Negative affect	1.54 \pm 0.84
17	I felt successful	Competence	2.92 \pm 1.00
18	I felt imaginative	Sensory and Imaginative Immersion	2.77 \pm 1.25
19	I felt that I could explore things	Sensory and Imaginative Immersion	3.54 \pm 1.45
20	I enjoyed it	Positive affect	3.38 \pm 0.74
21	I was fast at reaching the game's targets	Competence	2.92 \pm 1.00
22	I felt annoyed	Tension/Annoyance	2.00 \pm 0.78
23	I felt pressured	Challenge	3.62 \pm 0.62
24	I felt irritable	Tension/Annoyance	1.85 \pm 0.66
25	I lost track of time	Flow	2.62 \pm 1.08
26	I felt challenged	Challenge	3.92 \pm 0.73
27	I found it impressive	Sensory and Imaginative Immersion	3.85 \pm 0.86
28	I was deeply concentrated in the game	Flow	4.31 \pm 0.61
29	I felt frustrated	Tension/Annoyance	2.23 \pm 0.89
30	It felt like a rich experience	Sensory and Imaginative Immersion	3.54 \pm 1.08
31	I lost connection with the outside world	Flow	2.54 \pm 1.01
32	I felt time pressure	Challenge	3.46 \pm 1.01
33	I had to put a lot of effort into it	Challenge	2.31 \pm 0.99

Table 3: Game Experience Questionnaire - Post-Game Module
In addition the values mean and standard deviation attached

ID	Question	Type	Answers
1	I felt revived	Positive Experience	2.92 ±1.21
2	I felt bad	Negative experience	1.85 ±0.95
3	I found it hard to get back to reality	Returning to Reality	1.77 ±0.80
4	I felt guilty	Negative experience	1.31 ±0.46
5	It felt like a victory	Positive Experience	3.08 ±1.21
6	I found it a waste of time	Negative experience	1.77 ±1.05
7	I felt energised	Positive Experience	2.85 ±1.10
8	I felt satisfied	Positive Experience	3.38 ±0.92
9	I felt disoriented	Returning to Reality	2.31 ±1.26
10	I felt exhausted	Tiredness	2.15 ±1.29
11	I felt that I could have done more useful things	Negative experience	2.38 ±1.21
12	I felt powerful	Positive Experience	2.69 ±1.26
13	I felt weary	Tiredness	2.00 ±0.96
14	I felt regret	Negative experience	1.46 ±0.63
15	I felt ashamed	Negative experience	1.31 ±0.61
16	I felt proud	Positive Experience	3.00 ±1.18
17	I had a sense that I had returned from a journey	Returning to Reality	2.38 ±1.00