Level of Fear: Analysis of Fear Spectrum into a tool to support Horror Game Design for Immersion and Fear

Article · July 2018

1 author:

Konstantinos Ntokos
Southampton Solent University
7 PUBLICATIONS   **38** CITATIONS

"LEVEL OF FEAR": ANALYSIS OF FEAR SPECTRUM INTO A TOOL TO SUPPORT HORROR GAME DESIGN FOR IMMERSION AND FEAR

Konstantinos Ntokos

School of Media Arts and Technology,
Solent University of Southampton, Southampton, United Kingdom

ABSTRACT

This paper proposes a tool to be used by aspiring horror game developers, to design more horrifying and immersive horror experiences by distributing the psychological aspects of fear into a spectrum of emotional components that could represent different states in a horror game.

KEYWORDS

Game Design, Horror Survival Games, Immersion, Terror, Panic, Fear, Stress, Anxiety

1. INTRODUCTION

Horror games can be a daunting game genre for a game developer to tackle. This is true, especially when game designers have an extra layer of difficulty to think about: fear. This brings even more challenge to a game development team, especially when different developers have different perceptions of what fear is. A solution is needed to bring those developers together and on the same page, when it comes to the idea of implementing, designing and categorizing fear.

This document is written to provide game developers who wish to develop their own horror games, with a scale-like tool that can be used to measure the amount of intensity or fear in any given game situation, which can be used to transfer the game designer's ideas of how scary a model should look like, or how frightening a battle mechanic should be, or how bone-chilling the ambient sound should be like. This is all supported by psychological theories of one of the most basic emotions for any living being: Fear, along the components that comprise it. The design principles stated here or the ways a game developer can categorize and/or measure fear are by no means the perfect or the only way to do it, but their purpose is to act as a reference to horror game design. Essentially, we are attempting to bridge the gap between psychology of fear and horror video games.

This tool has different uses and importance. First, as stated already, this is used in order to clarify what the word "scary" means to a game development team. What a single game designer considered scary might not be as scary for another designer. This tool makes sure that everyone is at the same page. Secondly, as stated above, with this tool, one designer can easily pass the message as to how scary is a specific boss fight to the programmers to ensure they code the visual effects needed to transmit the required amount of fear towards the player, as well as the artists to make sure that the visual representation of the boss is as hideous as required. Third, this tool can be used throughout all the game levels to plot out a possible graph that represents intensity levels throughout the whole game, and in doing so, will let the designers calibrate the difficulty or scariness of the game as needed. This is also extremely helpful to point out the pacing of horror in

a game, as well as the period when a reduction of fear levels is required, to keep the player's mental state stable. Lastly, this tool can be used to mark all components of a game based on the level of fear they transmit to the player, and in doing so will enable the game development team to classify and sort all of their in-game monsters or all of the in-game rooms and environment or levels based on their "level of fear". This can be utilized in cases when you want to make the player walk through a "gauntlet of adaptive horror levels", one worse than the previous in terms of enemies, appearance, and the level of fear.

2. PSYCHOLOGICAL ASPECTS OF HORROR GAMES

Horror games can be inspected from another perspective from the way they affect the players. Indeed, if the basic psychological aspects of fear are incorporated into the game design process during the pre-production phase of a horror game under development, it would certainly mean that we would have a terrifying experience waiting for our players to come. Especially if our experience brings VR and immersion into play. Before considering the matter however, it would be wise to first inspect the actual players and users currently enjoying horror games and horror experiences.

2.1. WHY DO PEOPLE ENJOY HORROR GAMES?

Even if they can make someone shout as they play, or just make him give up in frustration, or shiver in fear by making cautious moves in the game, what is it that keeps making those players coming back for more? Why do we see this new trend on YouTube, being players that enjoy showing off to other people how scared they are by playing horror games? Why do people enjoy watching those players screaming as they play such games? Why do people keep playing horror games after their heart was racing as they were facing a new horrid monstrosity in a virtual environment? Why do players enjoy vividly frightening and uncomfortable experiences?

Jamie Madigan (Author, Getting Gamers: Psychology of Video Games), Thomas Grip (Creative Director, Frictional Games) and Philippe Morin (Co-Founder, Red Barrels Studio) [1] have given a couple of answers to those questions, based on results found from researchers on the matter, as well as their own industry experience. By these, we can categorize horror players into two discrete groups: Those who play for the immersion, thrill and adrenaline of it, and those who play for the social aspect of it.

The first group of players is believed that they enjoy being frightened, in the same way people enjoy breath-taking extreme sports and activities, such as bungee jumping or going down in great speeds in a roller coaster. The reason behind this, is that it makes them feel more alive, and it gives them a great sense of achievement and relief once the horror is over (for example, after visiting a save point or a "safe-room"). In the end, this is all happening in a simulated, trial-and-error environment, meaning that should the character they control die in game, nothing happens in real life, and they can start over from the previous checkpoint.

The second group of players is mostly playing horror games to show off and/or impress their friends and the opposite sex. Talking about playing creepy horror games without any fear or emotional attachment, trying to make others feel that you are fearless and tough, and taking it to the next level, recording yourself playing such games and putting them in YouTube is supposed to impress other people into liking you more.

2.2. ANALYSING FEAR INTO A SPECTRUM TOOL

Before designing an aspect of a game, an extra-useful tool under our belt would be a way to analyse fear into a spectrum of emotional components that could be used as reference as we design our characters, enemies, stories, environments, puzzles and even mechanics, user

interfaces or artificial intelligence. It would certainly be beneficial to have a clear understanding of each emotion and how to make proper use of it in any game design context.

This spectrum could be plotted out in a scale of 1 to 10 named "Level of Fear", comprising of Emotional Intensity (which could be positive or negative). Emotional Intensity represents how much scared or calm our player is (depending on the positive or negative value of the Intensity) and its' values can be further grouped into discrete emotional components. Each component has its' own unique range of values that possibly represent the emotional state of the player feeling that specific emotion. The naming convention for most of those levels follow the emotion categorization proposed by Shaver et al. (2001) [2].

2.2.1. LEVEL 1 - CALMNESS

Let's begin with Calmness. We can define calmness as the mental state of peace of mind of the player, when he is not agitated, excited, disturbed by any external stimuli. Furthermore, we could define it as the feeling of serenity, tranquillity and/or peace [3]. We have placed this feeling in level 1 of our scale, meaning that there is nothing for our player to fear. It could be a safe spot without any enemies spawning, a save point or checkpoint (after which, even if we die, we may spawn right there), or a sanctuary of some sort, like the very first level of a game, or a tutorial, or a place heavily guarded by non-player characters and/or has an abundant amount of health and ammo pickups, or no enemies at all. In general, it's the mental state of the player when nothing of harmful nature is happening or can be predicted to happen in the immediate future.

2.2.2. LEVELS 2 TO 4 - ANXIETY

Moving on to putting very slight pressure to the player, we have reached levels 2, 3 and 4, in which the dominating feeling / emotion is Anxiety. As stated by the NHS [4], anxiety is a feeling of unease, such as worry or fear, which could be mild or severe. As such, at level 2 we have mild anxiety, level 3 moderate anxiety and finally at level 4 severe anxiety. All those levels can be further implemented in horror games with specific game states that trigger this feeling to the players.

Furthermore, according to Greg Dorter (MA, Registered Psychotherapist) [5], anxiety can be further broken down in four components: Physiological (physical symptoms such as increased heart rate or nausea), Behavioural (symptoms in human behaviour), Emotional (Transitions between emotions) and Cognitive (thoughts and worries about negative feelings and/or events). Of those four, we really need to just care about Behavioural and Cognitive. In terms of game psychology, depending on the levels of anxiety, our player may start to make rash decisions or not think about things as clear. As to the cognitive aspect, the player may start feeling unsure about some of his in-game decisions, like "What if the path I chose was the wrong one?" or "What if I am not strong or prepared enough for what's coming" or "what will happen in five minutes?". Nevertheless, this is a common level of fear found in games.

2.2.3. LEVELS 5 TO 6 - STRESS

The feeling of stress comes after elevated anxiety from the player. The basic difference between anxiety and stress is that people get stressed after external stimuli, known as stressors [6], such as stressful events pressures them into the state of stress. Anxiety only comes after the stressors are not noticeable by the player or are gone [7]. This means that the level of fear could either go down to anxiety levels after stress is over or up to even worse fear levels if the stressors materialize and augment their presence towards the player.

Stress is the final level before getting into actual fear. It's when the player feels overwhelmed by something he may not be able to comprehend, or when he is lacking self-esteem and basic

decision-making skills. We have put stress in levels 5 and 6. Mild stress being at level 5 when things start to get out of control because of the mental pressure the player is in, and serious stress at level 6 when the player simply starts to let his survival instincts kick in and be in constant vigilance for enemies, while ignoring part or all the game environment.

2.2.4. LEVELS 7 TO 8 - FEAR

The next level in our spectrum is the primitive emotion fear itself. Fear exists in all living organisms [8] and its part of our primal instincts. Currently, there are many theories debating how fear can be classified. Based on the Neurofunctional theory, we have 2 systems: fear and panic itself [9]. Then, we have the Adaptive theory, based on which fear is an instance of a more basic and broader system [10]. We also have the Modular theory, which states that fear is broken down into modular pieces, namely the phobias [11]. Another theory is the Dimensional one, which suggests that fear can be plotted in a two-dimensional graph between arousal and valence [12].

Fear is usually conceptualized as something adaptive, able to change based on confrontations with threatening stimuli [8], and exposure to dangerous elements that force someone to change his behaviour, for example fleeing, hiding, screaming, freezing from traumatic and/or shocking events. We could say in that matter that when someone is afraid, we mean that he is feeling insecure or unsure as to something that he doesn't know. From this, we can safely assume that someone feels fear when at least a minimal amount of risk is involved. The more risk involved, the stronger the feeling of fear. But the type of risk needs to be determined as well, because for example the level of fear for physical and life risk is much larger than the fear for financial risk. Finally, the risk perception [13] of someone is another variable that determines the final levels of fear, because if, for example, we have an unknown monster in a game in the form of black cloud. If the player can't perceive this as a hostile being then chances are that he doesn't get scared.

As per our spectrum, we have placed fear in levels 7 and 8. In level 7 we have mild fear, which is happening as soon as we encounter an enemy or an unknown being but its' far away. Threat is imminent, but not as close. As we get closer, and the audio gets tenser, and we hear the footsteps of the monster, our level of fear is raised up to 8, which is severe fear. That is, unless we have a weapon to combat the monster, which is something entirely different that we will cover in section 3 of this paper.

2.2.5. LEVEL 9 – TERROR

One more feeling that we will explore and place in the spectrum of fear is the feeling of terror. Terror is defined as an intense or extreme and overwhelming feeling of fear [14]. Same rules apply here that can be applied for fear, but in more elevated levels. The feeling of terror is the definite feeling of horror in horror games. Terror also manifests when we are facing our phobia heads up.

In terms of the spectrum, we place Terror at level 9, which is right after severe fear in level 8. Usually, when a monster is noticing us, chasing us, screaming at us, or showing unknown attack patterns, rises our reflexes to their maximum, while most of our control comes directly from our instincts. Naturally, we have a very high heart rate as this happens because we try to act as quickly as we can to survive, being it a hiding, fleeing action or even a direct counterattack. It's clearly noticeable that when attacking during the terror state our accuracy is very low.

2.2.6. LEVEL 10 - PANIC

We are finishing the levels of fear using the feeling of Panic. Panic is the strongest and most dominant type of fear. Anyone suffering from the feeling of panic has a complete loss of their reasoning and logical skills, replacing them with frantic agitation, similar to the fight-or-flight

situation [15]. Typically, during a fight-or-flight situation, an immediate and dangerous threat is presented to someone, usually bringing him in a life-or-death situation. At the occurrence of such event, cortisol and adrenaline hormones are released [16], and the reflexes of the individual are being sky rocketed so as to either escape or counter attack. The duration of panic in a horror game context would be instantaneous, as then, the level of fear would fall into a lower level.

This is placed on the final level in our spectrum, level 10, and comes right after terror has reached its climax. Usually in games, this is the case of a well-placed jumpscare that was built over time via tension through visuals or audio, or the monster being awfully close to us, or even catching us. During panicking, the player is unable to react based on reason, and as such, any reactions from the player are purely based in his primal instincts. That could either be a well-timed counter attack or escape (based on the flight-or-fight situation) or something more instantaneous such as a game pause or even throwing off your controller or headset because of frustration and the tendency to escape from the game world.

2.3. REDUCING LEVEL OF FEAR: RELIEF

Relief is a short term feeling of reassurance and relaxation that is followed after reduction or complete removal of disturbing feelings such as anxiety, stress or distress in general [17]. A special rule in our spectrum of levels of fear is a mechanism that allows for reduction of fear levels. That can be achieved when we use the feeling of relief as an "injection" in our player's mental state. Depending on the power of the "injection" our player's level of fear may drop down more than one levels. Just like panic however, the relief mechanism has a very short-term duration but with instant effects.

This can be used as a technique to "calm the player down", in cases when extreme levels of fear where achieved for long periods of time, as well as to give them the "thrill of victory" that they so desire. The players who play for the adrenaline and the thrill of it live for just this moment, when the "relief injection" takes place, as it gives them a sense of achievement and accomplishment over the horror, or the unknown.

3. "LEVEL OF FEAR" SCALE AND PRACTICAL EXAMPLES

Summing up, we have defined our fear component spectrum that can be used in games, and have categorized some feelings and emotions along that spectrum, by the value of which game designers can now describe the level of fear at each situation as well as define the points in the game where the "relief injection" takes place, along with the power of it. This spectrum can be used as a reference point for game designers when they design any aspect of a horror game. More specifically, this can be applied to visuals, audio, environment and level design as well as Story and Character design. An important note here is that, generally, we should always keep in mind that, the higher the level of fear, the less control the player has, and primal instincts and reflexes start kicking in, "taking the wheel". Following, we will show a few examples where this rule can be applied in game design.

3.1. PRACTICAL EXAMPLES FOR EACH LEVEL

Level 1 – Calmness can be applied in game states where we want the player to start learning how to play the game. We should use level 1 only in cases where we want the player to feel safe, to promote exploration or a puzzle segment of a game, even though we can still have puzzles during other levels, and we could also achieve this level by populating a dangerous, otherwise level 5+ area with strong NPCs that can take out the enemies for us. An example of Level 1 in a horror game is the safe house in Left 4 Dead [18].

Level 2 – Mild Anxiety or Nervousness comes when things or facts unknown to the player start emerging in gameplay, but not in a matter that it can be perceived by the player directly. For example, when our character reads and finds out that strange things are happening inside the asylum building in Outlast [19]. Possible threats could emerge but there is no audio-visual cue to justify it. That's still calm but it could create a bit of nervousness to our player as to what could happen if he enters the asylum. So, the cognitive aspect of anxiety kicks in: "What if I go in? Will those murderers get me as well? Do they even exist?".

Level 3 – Moderate Anxiety or Vigilance is the logical expansion of level 2, where those doubts or questions that the player may have start to get justified and evidence is moving them towards believing that those fears they had might be true. This is done through evidence of blood and gore, bodies on the ground, and in general, justification of their fearful questions and doubts they had at level 2. Players at level 3 are starting to pay attention to the environment around them as well as the NPCs that comprise it. For example, this was achieved at Outlast [19] when the character first saw murders happening on screen or corpses in a room.

Level 4 – Severe Anxiety or Restlessness is when the visual cue from level 3 gets accompanied by an audio cue. Just visuals mean that something happened here either 10 years or 5 minutes ago, but the player can never be sure. With audio cues kicking in, the player gets the sensation that something bad is happening right now, so he should be more careful and be on the lookout, for threats could appear out of nowhere. This level can be easily surpassed quickly so as to move the player towards level 5 or it could just keep messing with the player, so they start to fear about everything around them. In that case, small objects could start moving on their own or strange things happening around the environment. For example, a ball being dropped from the staircase (a well-used cliché that can be seen in both Resident Evil 7: Biohazard [20] as well as the Layers of Fear [21]) when the only way to proceed is towards the staircase, will build up a lot of tension to the player, possibly bringing them up a few levels in terms of fear.

Level 5 – Mild Stress or Tense is when the player starts getting a lot of pressure from either visual, audio cues or physics effects occurring in his surrounding environment. Effects like the ball effect from level 4, but this time, magnified. More objects moving on their own, unexplainable and surreal things happen for just a few instances in time, giving the feeling that the character may be imagining or having serious hallucinations, vases being dropped, broken, doors bursting open or closing shut quick on their own, and this can be even achieved with the usage of creepy doll-like mannequins or statues that however keep looking at you or move closer to you when you are not looking. This can be clearly seen at the last segment of Layers of Fear [21].

Level 6 – Severe Stress or Distress is the final level which doesn't involve direct or indirect contact with the unknown enemy. Usually at this state, the player will have enough pressure to be on the lookout for threats, for the environment, for audio cues that may signal or give in the position of the enemy or it could be that he is witnessing an act of violence from an enemy to a friendly NPC, possibly foreseeing that he may have the same future. This could also be the case when the player is trying to stay hidden away from a monster's line of sight, while he is also working on something else at the same time. For example, in Silence of the Sleep [22], you must solve a puzzle while being on the constant lookout for an enemy that roams the same area in which you must solve the puzzle.

Level 7 – Mild Fear or Fright is when you first encounter the enemy and now you must prioritize your survival above all. True, there might be a goal where you must solve a puzzle or go to a specific point in the environment to progress the main story, but at the same time there may be a monster around trying to hinder the player's movement. That's when hiding, sneaking, using stealth and survival are on the top of the player's priority stack. The enemy can now be seen or

heard, and in nearby vicinity. The player's movements start getting slow, as he is trying to figure out his next move based on the enemy's behavioural and path pattern. This level is experienced for example when you first encounter an enemy in Amnesia [23], at the library section of the game, which is interesting, because there isn't an actual monster roaming around, you only get to see its' scripted appearance just to get you acquainted with its' appearance.

Level 8 – Severe Fear or Dread is occurring when the monster that the player is trying to avoid is close now, he can hear his footsteps, and even his breathing, and at this level it could either go a lot worse or a relief injection could take place and reduce the stress and intensity levels a bit. A player usually experiences it when a monster is actively looking for him, after a successful escape from an actual monster chase, during which the monster keeps looking around, inspecting different environmental objects, opening some closets or looking under beds (possible hiding places), just to give the sense to the player that he is never safe. Also, the sensation of complete loss of security, in which a player could be attacked and followed by enemies at any moment is successfully implemented in Silent Hill 4: The Room [24], where the enemy can never really die, and it always moves towards the player, no matter how far he is in the level. Even if doors are closed, they will break them, and even if walls are between them, holes will open in the walls, thus keeping up with the player.

Level 9 – Terror is the pinnacle of fear after level 8, because the instincts of the player have almost completely taken over control, possibly forcing the player to scream or shout and act based on his survival instincts. In games, usually this is the part when the player can perceive that the monster has seen him, even though there are possibilities that it hasn't. Another example is when the monster is giving chase to the player, so the player has to fight back or escape, possibly leading to a fight-or-flight response. This is based on the actual defences that the player character has. A player is feeling terrorised when he believes that he can't do much to beat the enemy and he is pretty much a living bait. An example of level 9 in horror games could be any chase sequence when the enemy has actually seen us and is giving us chase. The more control we have of the character, the higher the levels of fear, because being chased during a QTE (Quick Time Event) sequence, like in Until Dawn [25], is different than being chased when we must escape using our gamepads. Terror is also achievable in cases where you have to reload or when you run out of ammo when you fight an enemy, for example in The Evil Within [26].

Level 10 – Panic is the final level of fear, at which the mental state of the player is completely unstable, at the point that even the seasoned horror veteran may scream or at least experience a short breathtakingly shocking moment and get a high heart rate. Others who are more susceptible to fear from horror games are more likely to toss their controller or take out their headset, even being shaken away from the chair they are sitting, because it has a lot of impact to them. In practice, this can be achieved at the highest possible tension moments, such as a sudden appearance of an enemy which is performing a surprise attack at the same time, a strong cleverly placed jumpscare or the fact that the enemy has almost caught and killed the player character. This can be illustrated in Five Nights at Freddy's [27]. Below is a table summarizing the game situation and practical usage of each fear level based on the spectrum we just analysed.

Table 1. Level of Fear Spectrum

Level	Feeling / Emotion	Game Situation	Typical Examples
1	Calmness	Complete absence of fear; Player can freely explore around;	Safe-House, Sanctuary, Save Point, heavily guarded area
2	Mild Anxiety (Nervousness)	Partial existence of the unknown that has caused possibly deaths, player is intrigued but doesn't know much information	Traces of unexplained or supernatural phenomena around environment through story elements
3	Moderate Anxiety (Vigilance)	Fear starts being added in; Player must be aware of the environment	Visual cues of blood and gore, evidence of unknown murdering forces
4	Severe Anxiety (Restlessness)	Fear is adaptively giving trouble to the player who must pay attention to the environment around him.	Audio cues building up tension, minor objects start operating on their own with minor changes
5	Mild Stress (Tense)	Player fears what he cannot see or hear or explain; Minor or major changes in the environment around the player is more likely to scare him now	Hearing voices or footsteps, but not seeing anything, inanimate objects moving, falling or breaking
6	Severe Stress (Distress)	Fear is starting to take away reasoning and logic from the player; survival instincts start emerging	Witness an act of violence through visuals and /or audio
7	Mild Fear (Fright)	Survival instincts and quick reflexes are taking the place of reasoning and logic; The player is more likely to get scared via minor environmental changes	Audio-visual cues as to the whereabouts of an enemy who is far, common weak jumpscares, hiding
8	Severe Fear (Dread)	Player is focused on not being detected by the monster; Danger would be lurking at any corner now	Audio-visual cues as to the whereabouts of an enemy who is close by, loud noise jumpscares
9	Terror	Player will either survive or not; Quick actions have almost taken the place of control and reasoning	Enemy chasing player, running out of ammo or reloading during combat
10	Panic	Complete absence of control; fight-or-flight situation; pausing/exiting the game, leaving controllers or taking off headset	Enemy surprise attack, Strong Jumpscare, Enemy has almost caught the player

3.2. RULES AND ADVISE TO GAME DESIGNERS ON THE "LEVELS OF FEAR" TOOL

Showing off this spectrum and the subcomponents of fear that comprised it along with the concept of "relief injections", as well as its' typical usage in games is perceived as an additional useful tool to be used by game designers working in a horror game. But what are the rules of it, and when do they really need to use it? The answer is that there are no rules. As stated above, this is a tool, which was developed to design horror games and give a better perception to peers (artists, programmers, other designers) about the psychological and mental state of the player as he is experiencing these in-game sequences.

This scale can be freely adjusted to any game design process and any horror game in particular. Another useful piece of advice is that not all games can follow the same scale. For example, in a game when your character is completely defenceless, on average, most of the game time might be spent at levels 3 to 6 while also being able to peak at level 10. Another example would be a game where your character is heavily armed and has a way to fight back the enemies, such as The Evil Within, Resident Evil and Silent Hill games. While it's still possible to get to very big levels such as 8 or 9, it's much less likely to occur because the game is not as tense as to if you didn't have any weapon to fight back and clear a path so you could stroll happily towards the end of each level. Such games don't tend to go over level 7 this easily. In the same game however, this could be bumped up a lot higher if we didn't have any weapons.

The same can happen depending on the perspective of the game. We would get different fear levels in a 3rd person game (Silent Hill games) and a 1st person game (Resident Evil 7: Biohazard). While in both games we have weapons to fight back, the fear levels are significantly higher at the latter game, because we are looking through the eyes of the player. This is even more enhanced if we add VR in the mix, which doesn't always work with 3rd person games.

Finally, this tool can be applied to games of any length. Being a lengthy game like Alien: Isolation [27] or a quick one like Slender [28], we can still classify the segments of those games in the level of fear spectrum. Especially in the case of Slender, we can clearly see the level of intensity that is rising after each and every little piece of paper is picked up.

4. CONCLUSIONS

Our final advice to developers would be to experiment using this scale to define certain segments in the game about the levels of fear they would induce to the players, and then adjust this scale to their game as they see fit. Overall, this is an interesting and informative way to let people in your team know about the intensity of this fight, or the overall intensity of the level, or how fear inducing is this designed character just by looking at it. Same rule applies for background audio cues, ambiences, so on and so forth.

ACKNOWLEDGEMENTS

REFERENCES

[1]   W. games and M. Butler, "Why people play horror games - The i newspaper online iNews", iNews, 2017. [Online]. Available: https://inews.co.uk/essentials/culture/gaming/people-play-horror-games/. [Accessed: 22- Jun- 2017].

[2]   "Basic Emotions", Changingminds.org, 2017. [Online]. Available: http://changingminds.org/explanations/emotions/basic%20emotions.htm. [Accessed: 22- Jun- 2017].

[3]   "Calmness", TheFreeDictionary.com, 2017. [Online]. Available: http://www.thefreedictionary.com/Calmness. [Accessed: 22- Jun- 2017].

[4]   "Generalised anxiety disorder in adults - NHS Choices", Nhs.uk, 2017. [Online]. Available: http://www.nhs.uk/conditions/Anxiety/Pages/Introduction.aspx. [Accessed: 22- Jun- 2017].

[5]   "Model of Cogntive Behavioural Therapy (CBT) for Anxiety", Greg Dorter Therapy Blog, 2017. [Online]. Available: https://www.guelphtherapist.ca/blog/four-components-of-anxiety/. [Accessed: 22- Jun- 2017].

[6] "How is Anxiety Different from Stress? - Stress and anxiety", Health Status, 2017. [Online]. Available: https://www.healthstatus.com/health_blog/depression-stress-anxiety/how-is-anxiety-different-from-stress/. [Accessed: 22- Jun- 2017].

[7] "Struggling with stress? - Stress, anxiety and depression - NHS Choices", Nhs.uk, 2017. [Online]. Available: http://www.nhs.uk/Conditions/stress-anxiety-depression/Pages/understanding-stress.aspx. [Accessed: 22- Jun- 2017].

[8] R. Adolphs, "The Biology of Fear", Current Biology, vol. 23, no. 2, pp. R79-R93, 2013.

[9] J. Panksepp, Affective Neuroscience: The Foundations of Human and Animal Emotions, 1st ed. New York: Oxford University Press, 1998.

[10] J. LeDoux, "Rethinking the Emotional Brain", Neuron, vol. 73, no. 5, pp. 653-676, 2012.

[11] A. Öhman and S. Mineka, "Fears, phobias, and preparedness: Toward an evolved module of fear and fear learning.", Psychological Review, vol. 108, no. 3, pp. 483-522, 2001.

[12] J. Russell, "Core affect and the psychological construction of emotion.", Psychological Review, vol. 110, no. 1, pp. 145-172, 2003.

[13] S. Hansson, "Risk", Plato.stanford.edu, 2017. [Online]. Available: https://plato.stanford.edu/archives/spr2014/entries/risk/. [Accessed: 22- Jun- 2017].

[14] "Definition of TERROR", Merriam-webster.com, 2017. [Online]. Available: https://www.merriam-webster.com/dictionary/terror. [Accessed: 22- Jun- 2017].

[15] "Panic", En.wikipedia.org, 2017. [Online]. Available: https://en.wikipedia.org/wiki/Panic. [Accessed: 22- Jun- 2017].

[16] "Fight-or-flight response", En.wikipedia.org, 2017. [Online]. Available: https://en.wikipedia.org/wiki/Fight-or-flight_response. [Accessed: 22- Jun- 2017].

[17] "relief - definition of relief in English | Oxford Dictionaries", Oxford Dictionaries | English, 2017. [Online]. Available: https://en.oxforddictionaries.com/definition/relief. [Accessed: 22- Jun- 2017].

[18] Left 4 Dead. Microsoft Windows, Xbox 360. United States: Valve Corporation, Electronic Arts, 2008.

[19] Outlast. Microsoft Windows, PlayStation 4, Xbox One, OS X, Linux. Canada: Red Barrels, 2013.

[20] Resident Evil 7: Biohazard. Microsoft Windows, PlayStation 4, Xbox One. Japan: Capcom, 2017.

[21] Layers of Fear. Microsoft Windows, Linux, OS X, PlayStation 4, Xbox One. Poland: Aspyr Media Inc, 2016.

[22] Silence of the Sleep. Microsoft Windows. Finland: Jesse Makkonen, 2014.

[23] Amnesia: The Dark Descent. Microsoft Windows, OS X, Linux, PlayStation 4. Sweden: Frictional Games, 2010.

[24] Silent Hill 4: The Room. PlayStation 2, Xbox, Microsoft Windows. Japan: Konami, 2004.

[25] Until Dawn. PlayStation 4. United Kingdom: Sony Computer Entertainment, 2015.

[26] The Evil Within. Microsoft Windows, PlayStation 3, PlayStation 4, Xbox 360, Xbox One. Japan: Bethesda Softworks, 2014.

[27] Five Nights at Freddy's. Microsoft Windows, Android, iOS. United States: Scott Cawthon, 2014.

[28] Alien: Isolation. Microsoft Windows, Linux, OS X, PlayStation 3, PlayStation 4, Xbox 360, Xbox One. United Kingdom: Sega, 2014.

[29] Slender. Microsoft Windows, OS X. United States: Parsec Productions, 2012.

AUTHORS

Konstantinos Ntokos is a Lecturer in Computer Games Development, at Solent University of Southampton. He has over 6 years of experience in the games industry through his indie studio as a Gameplay/ AI Programmer. His past work involves technical presentations for Microsoft, Instructional design and teaching for SAE Institute as a EU BSc Programme Lead and programming training at the Greek army as a Corporal. He has won many awards among best startup award at InfoCom Mobile AppsLand 2015 as well as a place among top-10 countries at Microsoft Imagine Cup's worldwide finals in 2013 and 2014. Kostas has finished his BSc in Digital Systems and his MSc in eLearning at University of Piraeus. His research interests include horror games, emotions during gameplay, Virtual Reality, Artificial Intelligence, eLearning and Immersion.