Emotional Resonance: Investigating the Role of Audio in Games

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Abstract

Well-designed emotional experiences can result in absorption and lasting appeal, resonating with players even after the end of the game and leading to re-playing. Yet people also seek out and enjoy emotionally challenging experiences in media, even ones evoking negative emotions. Research indicates that the emotional impact of game experiences can be increased through carefully designed audio. We discuss several research directions which could facilitate game designers in utilizing and exploring this effect in games featuring negative or mixed affect.

Author Keywords

audio; game design; immersion; emotional resonance; negative emotions.

ACM Classification Keywords

H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous

Introduction

People do not always require only positive emotional experiences in their consumed media; in fact, they sometimes actively seek out emotionally challenging experiences, characterised partially or fully by emotions such as sadness, anger, or fear. The concept can be retraced to the Ancient Greek's *catharsis* in drama, which can be described

as the relief experienced due to emotions of negative valence — without an accompanying cause outside of the narrative medium that triggers the emotion [24]. In the game medium, this often manifests during narrative-heavy games with emotionally difficult interactive choices (e.g. choosing who to sacrifice in *Life Is Strange* [11]) or sad themes and endings (e.g. *Brothers: A Tale of Two Sons* [27]). Fear and fright is often invoked by the horror game genre (see [23]).

Games generally try to provide pleasurable experiences for players, yet the theory of catharsis seems to imply that pleasurable experiences need not always depend upon only positive emotions. Ultimately, the goal of game design is engagement and absorption during play, and increasingly, encitement to re-playing. In order to effect this, games should try to achieve emotional resonance in their players, i.e. lasting emotional impact that leaves players with a favourable impression. Ideally, this favourable impression is then further strengthened by game design that encourages re-playing, through adaptive or non-linear game features [19]. While many players derive pleasure from games that can be characterised as emotionally minimal effort, e.g. *pottering* games [20], another approach to successful player (re-)engagement can require the design of emotionally complex game experiences. Games can then provide a safe environment for players to face complex, mixed, or negative emotions, in the same vein as music, or films.

Audio has been closely linked to emotions both in combination with and outside of media such as games or films (e.g. [10, 17, 2]). In games, audio has multiple roles: game audio can be classified as sound effects (generally triggered by player interaction), background music, and voice acting. As a whole, the overall game audio has a non-trivial impact on game usability through its role as feedback [9], and on the players' direct emotional perception of the game narrative, as an auditory emphasis of the emotions portrayed through the game's events. Further, while background music can influence the players' reaction to a game's narrative [8], the opposite can also apply: the visuals and narrative of the game can also influence the player's interpretation of the music [14]. Research into the influence of audio in games has shown great potential for influencing players in their reactions to and interactions with games. For instance, players exposed to voiceover audio of non-player character dialogues showed higher engagement than those with textual-only dialogues [7]. Dynamic music in games has been shown to lead to reports of higher immersion than non-dynamic music [14], while musical repetition without corresponding narrative reasons has been said to break immersion [4]. A qualitative study investigating the effects of a removal of dynamic background music in two different games showed a significant interaction between sound and the players' sense of control and presence [16].

Game Audio for Emotional Resonance

Based on this research into game audio, it seems clear that audio can indeed affect the player experience, in particular, player immersion and engagement. Yet due to audio's intrinsic link to emotions and memories, it also has an effect on players' emotional state — both through facilitating or strengthening existing emotions, and invoking them. Guidelines for sound design in games by Alves and Roque, for instance, explicitly encourage the use of audio to "support and translate emotions" [1]. However, a wrong choice in audio may easily break immersion, or lead to a kind of uncanny valley or broken fourth wall as the player realises the game designer's plan for their emotional response [15]. To further complicate matters, individual differences in personality, gender, and culture have a noticeable effect on music perception [13]. In this position paper, we discuss further the current view in literature regarding the appeal of neg-

ative emotions in games, and discuss several research directions which afford great potential for future research and collaboration in game design.

The Appeal of Negative Affect

Much as people occasionally enjoy listening to sad songs, or watching tragic films, a large subset of players enjoy games that invoke negative emotions, such as sadness or fear. There are a number of commercial games that focus on topics that typically foster negative emotions, such as games dealing with bereavement and coping with loss (e.g. the aforementioned *Brothers*), or depression and suicide (e.g. *The Cat Lady* [12]). The horror genre offers a multitude of games that attempt to strike fear into players — and much like its movie genre counterpart, it employs methods ranging from jump-scares as in *Slender* [22], to a more subtle build-up of fear as in the *Silent Hill* series (e.g. [29]). Clearly, games evoking negative emotions and experiences can be quite popular. Some even go as far as to induce physical pain, for example in the form of electric shocks in *Tekken Torture Tournaments* [25] or *PainStation* [21]. (This often pccurs as part of art performances rather than regular, commonplace games, albeit there are a surprising amount of traditional children's games that involve electric shocks, or pinching.) Recent academic research has similarly begun to produce and investigate games that can foster negative or mixed emotions in players. One recent example is *Taphobos*, described as an "immersive coffin experience", which requires one of the players to lie inside a physical coffin while the other searches for them within a virtual world via Oculus Rift [5]. Other work has explored vertigo and the accompanying loss of control as a design element for games [6]. Outside of games, mainstream human-computer interaction research has also begun to investigate the design space of *uncomfortable* interactions, as introduced and discussed by Benford et al. [3].

The reason why some players seek out these uncomfortable experiences is not entirely clear. It may partially result from the urge to experience such negative emotions in a safe environment, as a form of seeking sensation or learning to cope with negative emotions [30]. A study by Garrido and Schubert found a positive correlation between the psychological traits of absorption and music empathy, and enjoying sad music, which may be related [13]. However, they also acknowledge the need to distinguish in future research between enjoying sad music and actively seeking it out. The study also confirmed previous results that the appeal of negative affect in music varies on an individual basis.

Research Directions

The field of game audio offers great potential for research into player reactions to different emotions. In the following, we discuss several aspects which seem particularly promising towards designing for emotionally complex games.

Mixed Emotions

Our survey of related work has so far concluded that research is yet to settle the question whether negative emotions on their own are the goal for players of horror games. The appeal of negative emotions in games may only be a worthwhile experience — or attain greater appeal — when experienced in combination with positive ones. For example, the fear experienced upon encountering a monster in a horror game may be rated more positively when the emotion is followed by victory and relief after defeating it. Similarly, over the course of a sad game, players are usually confronted with both sad and and positive emotions (the authors know of no games fostering *only* negative emotions). The subsequent positive emotions may then be felt more keenly in the wake of negative ones. This would also imply that players' initial affective state may have a strong influence on their receptiveness to negative affect in games.

The interactive process of playing video games is a multi-construct of visuals, audio, narrative, and the players themselves, all of which influence the other components [14]; as such, there are many opportunities for research into affective reactions based on game audio.

Emotionally Dissonant Audio
Game audio is generally used to emphasise a specific narrative, i.e. sad music for tragic scenes, and happy music for cheerful ones. Yet a common trope in media uses music counterintuitively, by layering emotionally dissonant audio over game or movie scenes. Common examples of its use in movies (so-called *counterpoints*) can be found throughout *A Clockwork Orange* [18] or the torture scene in *Reservoir Dogs* [28]. As an example in game cinematics and trailers, *Fallout 3* [26] occasionally features a calm, positive song[1] as backdrop to an apocalyptic scene. This technique can be used to provide an additional narrative layer, as well as to contrast or criticise the scene's unfolding events. Similarly, music with lyrics can offer a different, additional, or contrasting perspective on the accompanying narrative. This technique has not yet been explored in much detail in games, but seems promising.

Individual Differences
As discussed by Garrido and Schubert, the appeal of negative emotions in music appears to vary based on individuals, that is, their personality, gender, and culture [13]. Even so, most of the studies on music perception and affective reactions to music are based on very homogeneous samples of participants, often those with extensive background or formal training in music. Yet players of games are very heterogeneous and harbour a wide range of motivations for playing [31]. Likely, their preferences regarding audio in games in similarly diverse. Further, research into individual preferences for affective music and how to assess these preferences could be valuable for research into game adaptivity, with the goal of eventually being able to provide an appealing emotional experience for different players.

Conclusion
Audio is clearly an important factor in game design and development; in particular, it has a strong influence on players' immersion and their emotional response to games and game narratives. Nevertheless, several research questions in the area of game audio remain unanswered, or only partly investigated. We pointed out several aspects that we consider particularly interesting for future research. Many of these would benefit greatly from collaboration and discussion with other reseachers in the field of games and player interaction. In particular, a collaborative team would be able to investigate effects of game audio on players across different nationalities and cultures. By utilising game audio to design and enhance emotionally complex game experiences, games may be able to adapt to a wider range of player preferences, and increase their replayability.

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