A Good Scare: Leveraging Game Theming and Narrative to Impact Player Experience

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ABSTRACT

Game narrative and theming are ways in which game designers can affect player experience. In this work, we incorporate theories of emotion into game design, to explore the relationship between

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Figure 1: Aesthetically different versions of the same game board. (TOP): Horror Version with dark red and black tones. (MIDDLE): Original game version. (BOT-TOM): Sanitized Version with light rainbow and pastel colors. aesthetic elements and player experience. We designed and playtested two differently themed variants of the game *Outbreak*, a 'Horror' and a 'Sanitized' version. We present preliminary findings about playing differently themed versions of the same game which suggest that scary content can sustain interest throughout play and transform players' emotional response to uncertainty.

CCS CONCEPTS

• Human-centered computing → Human computer interaction (HCI);

INTRODUCTION

Making strategic choices about narrative and theming allows game designers to affect player experience in desired ways. For example, narrative elements can engage players, provide context for mechanics, or prompt players to reflect on social structures [7]. However, the relationship between these design elements and player experience - and, in particular, the ways that psychological theory can inform these design decisions - is not yet fully understood. We illustrate this potential by work building on two key theories of emotion - misattribution of arousal [3] and benign masochism [9]. Specifically, we show how these theories, which both suggest that people use contextual information to make sense of their own emotional responses, can guide choices about narrative and theme in ways that affect how players interpret their own emotional experiences during or after play.

To explore this question, we produced two variants of *Outbreak*, a tabletop game designed to encourage curiosity-related behaviors. The original version of the game employed the theme of a mad scientist's laboratory; the new designs are a heightened 'Horror' and a neutral 'Sanitized' version (Figure 1). Our initial playtest findings suggest that the use of horror content can help to sustain interest throughout playtime and transformed players' emotional response to uncertainty during gameplay. In the future, we look forward to validating these findings with a larger-scale study.

RELATED WORK

Game Narrative and Theming

Narrative and theming are both important elements in a game designer's toolkit [11]. Current understandings of their role in player experience fall into three major categories: player engagement, creating context for game mechanics, and engaging players with content outside the game itself.

First, thematic and narrative elements can help players feel more connected to the game. In narrative-rich games, meaningful choices with tangible consequences increased players' enjoyment and engagement in play [7]. Games have previously been used to promote social emotional learning. For instance, scary themes in a game taught children about coping with anxiety [6].

Second, theming can provide context to help players understand game mechanics. Wason Task asks people to validate a hypothesis. Most players fail when they are dealing with numbers and letters.

But when a narrative of beer and ID check is introduced, solution rates increase sharply [4]. Players naturally realize that they have to check both the age of beer drinker, and the drink of under-ages. [8].

A third function of game theming is to connect the game to out-of-game experiences that enhance the game experience. For example, the autobiographical game Dys4ia deliberately evokes frustration using narrative elements to connect it to the designers' experience of gender dysphoria [2].

As these examples illustrate, theming and narrative can affect players' emotional experiences in a variety of ways. Here, we argue that psychological theories of emotion can allow game designers to anticipate and design for particular emotional responses to game elements.

Two-Factor Theories of Emotion

Among the most influential theories of emotion in psychology are the two-factor, which propose that emotions are generated from 1) a physiological reaction and 2) a person's *interpretation* of that reaction. We consider two theories under this umbrella: misattribution of arousal and benign masochism.

Misattribution of arousal occurs when situational cues lead individuals to incorrectly explain the source of their physiological arousal, often in psychologically protective ways [3]. For example, people report higher confidence in their ability when they can attribute anxiety to subliminal noise [10].

Benign masochism describes the phenomenon where pleasure is derived from the realization that the brain has falsely interpreted an experience as threatening after reaching a place of safety [9]. Examples include eating spicy foods, riding roller coasters, and engaging with suspense narratives.

These theories provide insight on how frightening content content might induce physiological arousal that game players interpret differently. We discuss them more deeply in our previous work [1].

GAME DESIGN

Outbreak is a tabletop game designed for the "Sensing Curiosity in Play and Responding" (SCIPR) project which aims to design and study games that encourage curiosity through play, particularly for marginalized youth who may benefit from increased emotional and social comfort with curiosity.

Outbreak is a cooperative question-asking game, in which the group must save a town from a rogue scientist by searching their laboratory for antidotes to a disease. Players work together to explore rooms in the mansion, represented as room scenario cards and use questions to find out necessary information about each room to overcome it's challenge. Another player plays as a sensing robot and helps the others by answering those questions using hidden information on the room scenario cards. More details about *Outbreak* can be found in our previous work [12].

PREVIOUS FINDINGS: PLAYERS' EMOTIONAL EXPERIENCES IN OUTBREAK

As part of a previous study on question-asking, we invited Pittsburgh youth (ages 9-14) to our lab to play *Outbreak* in a 90 minute study. 32 participants in randomly assigned groups of 3-4 played *Outbreak*,

	Sentiment	Disgust	Fear	Joy	Anger	Sadness
QA Phose	-0.40 (sd	0.17 (sd	0. 48 (sd	0.18 (sd	0.12 (sd	0.39 (sd
rnase	0.03)*	0.06)*	0.06)*	0.06)	0.03)	0.04)
Disc. Phase	-0.22 (sd 0.07)*	0.7 (sd 0.03)*	0.20 (sd 0.04)*	0.30 (sd 0.08)	0.30 (sd 0.03)	0.30 (sd 0.06)

Figure 2: Mean sentiment and emotion expressed from IBM Watson sentiment analysis during question-asking and discussion phases of the game. Sentiment is more negative and more disgust and fear are expressed during question-asking compared to discussion phases of the game. *(p < .05)

completed self-report measure of emotional experience during play, and we analyzed expressed emotion using IBM Watson Tone Analyzer (part of the IBM Watson Developer Cloud toolchain) on textual transcripts from audio recorded during play [5]. The IBM Watson Tone Analyzer service is a cognitive linguistic analysis service that detects 7 tones which are most commonly used to detect emotions found in text with high accuracy (macro-average F1 score ISEAR=0.41; SEMEVAL=0.68). For further details about the study procedure, please see our previous work [1].

Using Tukey comparisons we observed significantly more expressed fear, disgust, and negative sentiment in the question-asking (M_f =.48; M_d =.17; M_s =-.40) over the discussion (M_f =.20; M_d =.07; M_s =-.22) phases of the game at α = 0.05 (Figure 2). Initially this indicated to us that the question-asking phase was more difficult and more derided than the discussion phase. However, counter to this in the self-report data there was more positive response to question-asking over discussion events.

This dichotomy between students' expressed vs. reported emotions to the question-asking and discussion phase events led us to believe that there was some underlying factor misdirecting students' experienced fear and disgust away from the question-asking processes. Since, when designing *Outbreak*, we had included horror content in the hope that we might help players misattribute fear of question-asking to those horror elements, we wished to explore the possibility of arousal misattribution in more depth. This led us to create two versions of *Outbreak* altering aesthetic components of the game.

GAME VERSIONING

Using the version of *Outbreak* described in [12], two researchers developed 'Horror' and 'Sanitized' game variants using iterative design and playtesting [1]. The game structure remained the same as the original while aesthetic elements that could escalate one's sense of fear were isolated and altered.

We initially generated horror content for the room cards. To assure that others perceived the materials to differ on 'scariness' five adults not associated with the project ranked and provided justification for scariness level for each scenario. We found the 'scariest' factors were directly relatable to the player with immediate threats to physical safety (e.g., a lab room that is on fire). We isolated those 'scary' elements and altered or removed them accordingly. For example, the "Stuffy Closet" with deadly gas in the Horror version is a stuffy room the player needs to air out in the Sanitized game (Figure 3). While the content changes, the game mechanics and win conditions remain the same.

Card layout remained the same, but aesthetics such as images and color were altered. For instance, in the Horror version, images were more frightening (e.g., lightning) and used darker colors, while the Sanitized version used bright welcoming colors and amorphous images (Figure 1, 3).

The role of the robot player (in our playtesting, a researcher not involved in game design) is critical in setting the mood of the game. In the Horror version, robot players emphasize horror components more when describing each room. For example, if the players ask, "are there any animals?" in the room, the robot player might answer, "you can hear growling," whereas in the Sanitized game, the



Figure 3: Aesthetically different versions of the same room card. (TOP): New horror version: the lightning-backed Horror card mentions deadly gas and danger of suffocation. (MIDDLE): Original game version: plain black. (BOTTOM): New sanitized version: the rainbow-colored Sanitized card says it's stuffy in the room. robot player would reply with a simple "yes." The scenario cards are intentionally designed so the robot players can be creative in explaining the rooms based on the room description text.

During playtesting, we also checked for any unintentional differences between the games. We observed players, administered pre- and post-playtest measures, and conducted feedback sessions as per [1] but did not elicit any differences between the games other than those previously identified.

PILOT STUDY AND PRELIMINARY FINDINGS

To compare the two versions of the game, we recruited a convenience sample of 23 university students (ages 18-23) to play in randomly assigned groups of 3-4. Four of the groups played the Sanitized version, while three groups played the Horror version. Each study session lasted up to 90 minutes utilizing the same procedure as our previous study [1]. In our valence-arousal measure, 200-335 is coded as negative/low, 335-465 as neutral, and 465-600 as positive/high valence/arousal. Here we report preliminary trends arising from Tukey comparisons of valence for different game events. We refer to significant differences as 'trends' as the sample is too small to make statistical conclusions.

In the Sanitized version we observed a trend towards higher engagement in the first round of question-asking compared to the last round. No such trend was found in the Horror version. This may suggest that the Horror version helps maintain curiosity or engagement for a more sustained time.

In the Horror version we observed a trend that game events related to curiosity ($M_v = 409$) and uncertainty ($M_v = 509$) were reported as more emotionally positive than failure events ($M_v = 359$), while there was no such trend in the Sanitized version. This suggests that horror content can facilitate players' misattribution of unpleasant emotions to theme rather than vulnerability-inducing mechanics.

We believe that aesthetic elements can create a space in which players can express curiosity and experiment with uncertainty with less social pressure and self-doubt. In this case, horror content may activate emotional processes that provide a protective barrier to challenging experiences. The trends we observed are promising in uncovering a relationship between players' emotional experiences and aesthetics, encouraging further inquiry to confirm if they are borne out statistically by a larger sample.

IMPLICATIONS AND FUTURE WORK

Our work has thus far begun to uncover and understand the impact a game's thematic and narrative elements can have on players' response to game mechanics. Specifically, horror elements might provide an avenue for designers to mitigate the social risk of some game mechanics, such as those involving the expression and acceptance of uncertainty within a game.

After finalizing the three versions of *Outbreak*, next we plan to explore how different playgroups, including those of different ages and/or different levels of susceptibility to anxiety about expressing uncertainty (e.g., groups underrepresented in STEM), respond to the different versions of the game.

These findings build on game design practice that encourages a close relationship between mechanics and aesthetics. We find that mechanics can actually drive thematic choices as a way to balance the game and help make actions that are difficult or socially risky more accessible and less awkward for players. By incorporating psychological theories of emotion, game designers can more intelligently create games where narrative elements can promote positive emotional experiences.

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